

# KIC 008510534

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008510534-01	OBS	No	0.566522	131.938989	31.6	1.604	10.5	9.7	2.41	7666	1.45	65425.09
008510534-02	OBS	No	0.611838	131.683306	39.5	2.283	8.0	9.4	2.41	7666	1.75	59045.16

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008510534-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008510534-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

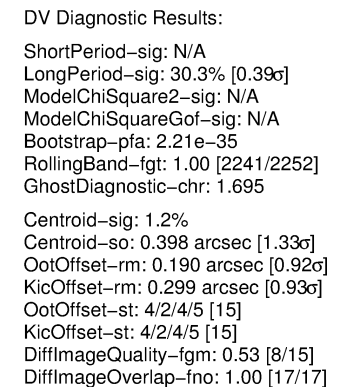
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

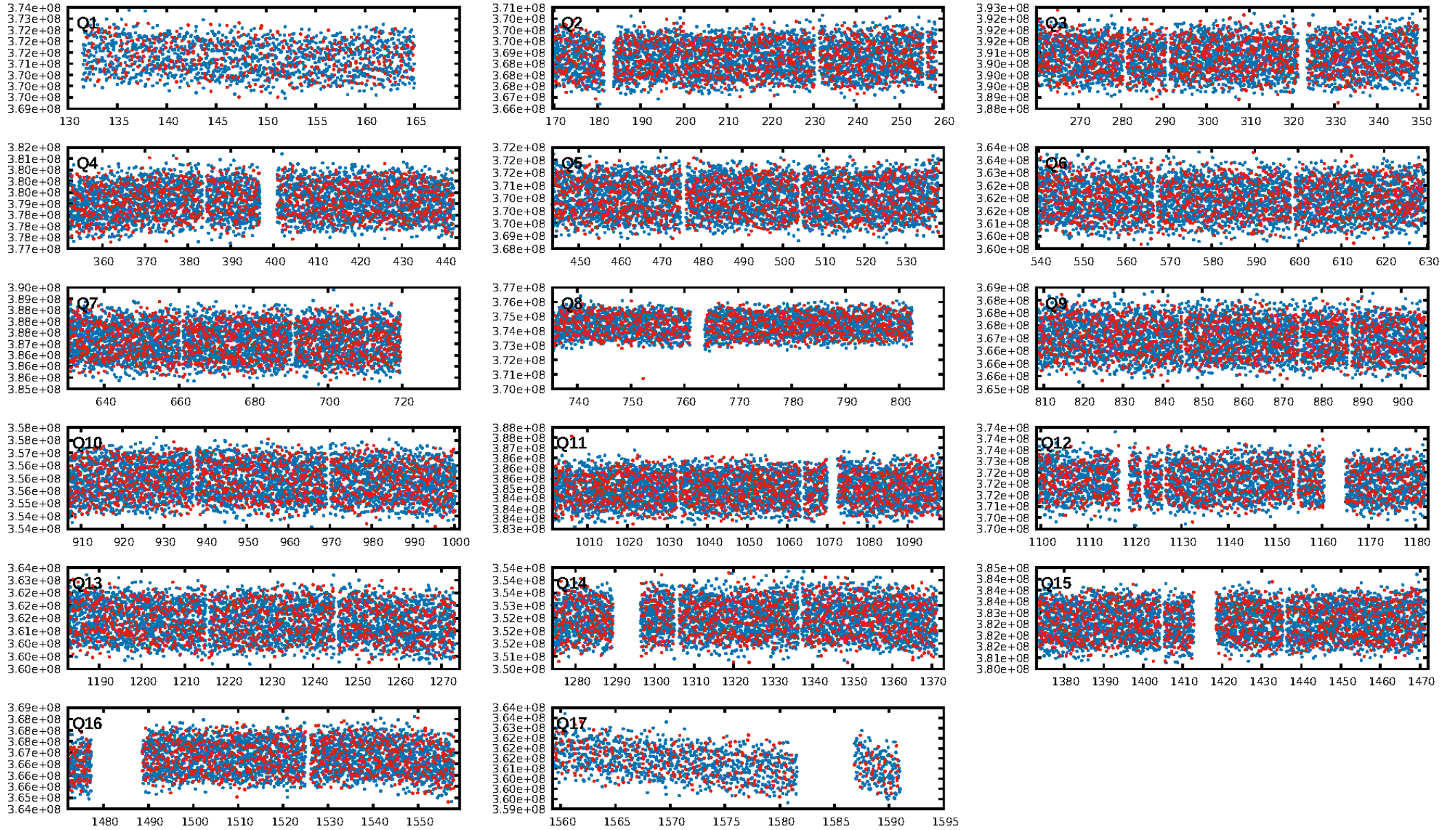
## Ephemeris Match Information For 008510534-01

No Significant Match Found

## KIC: 8510534    Candidate: 1 of 2    Period: 0.567 d

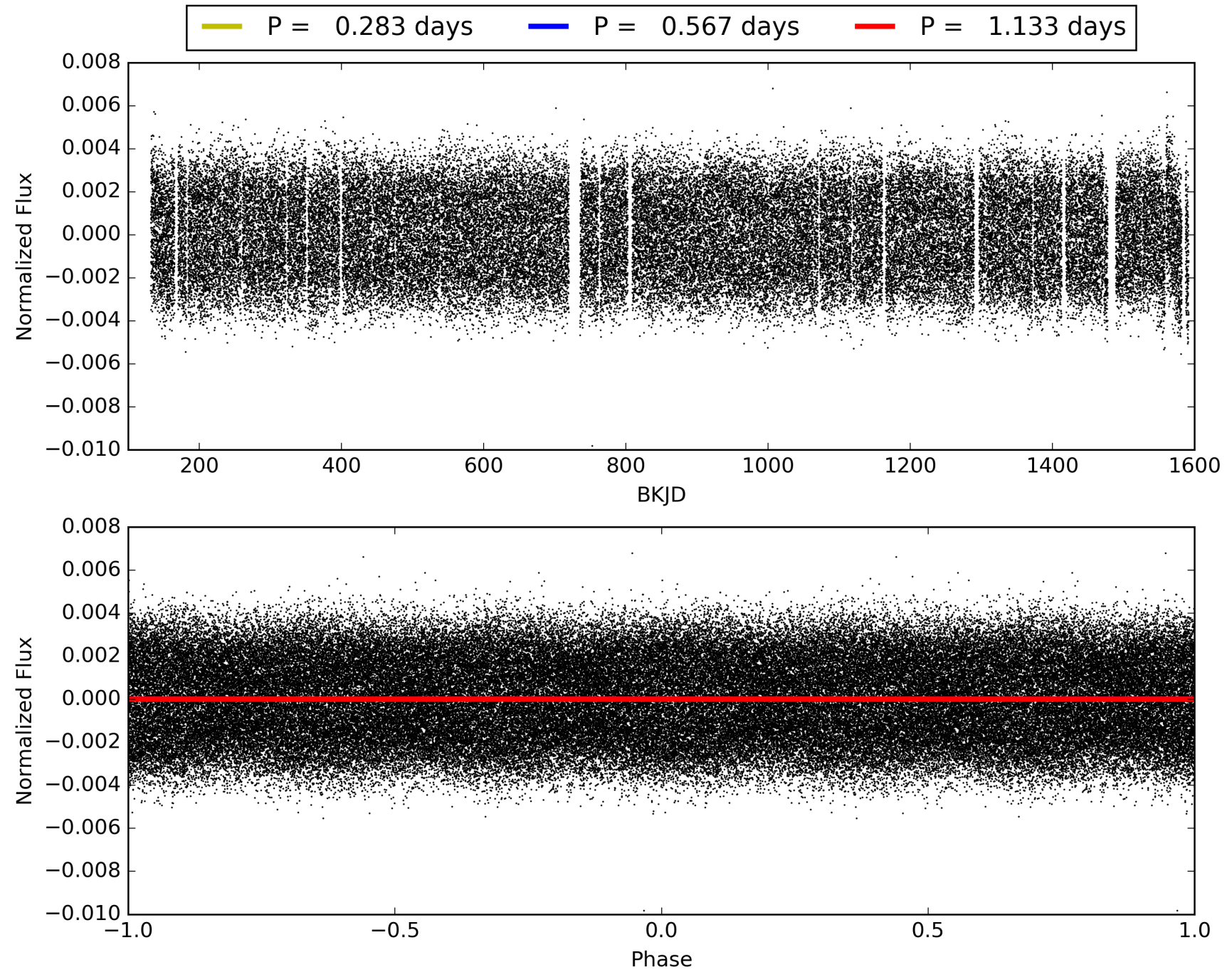


# TCE 008510534-01, PDC Light Curves



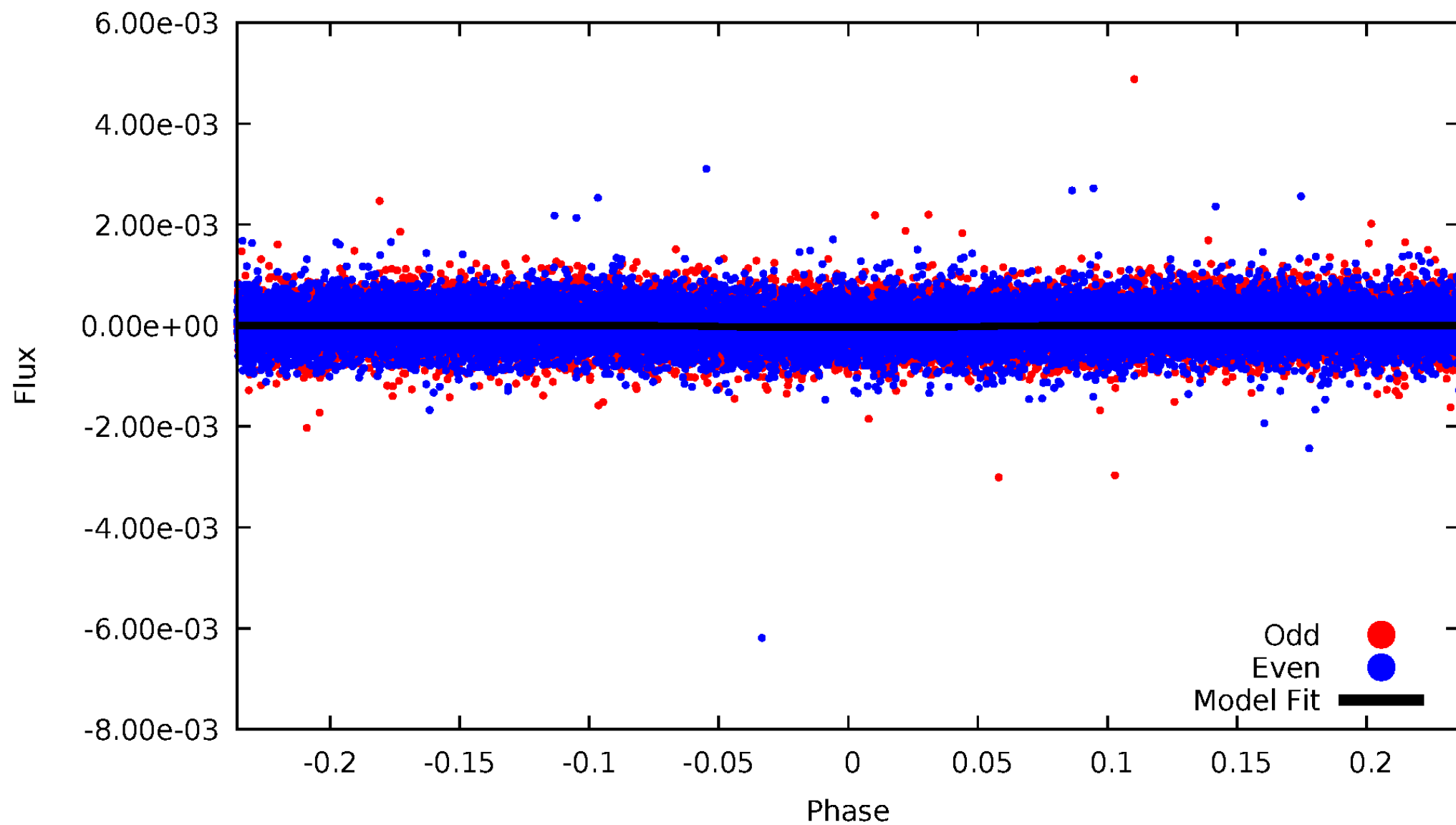


# TCE 008510534-01



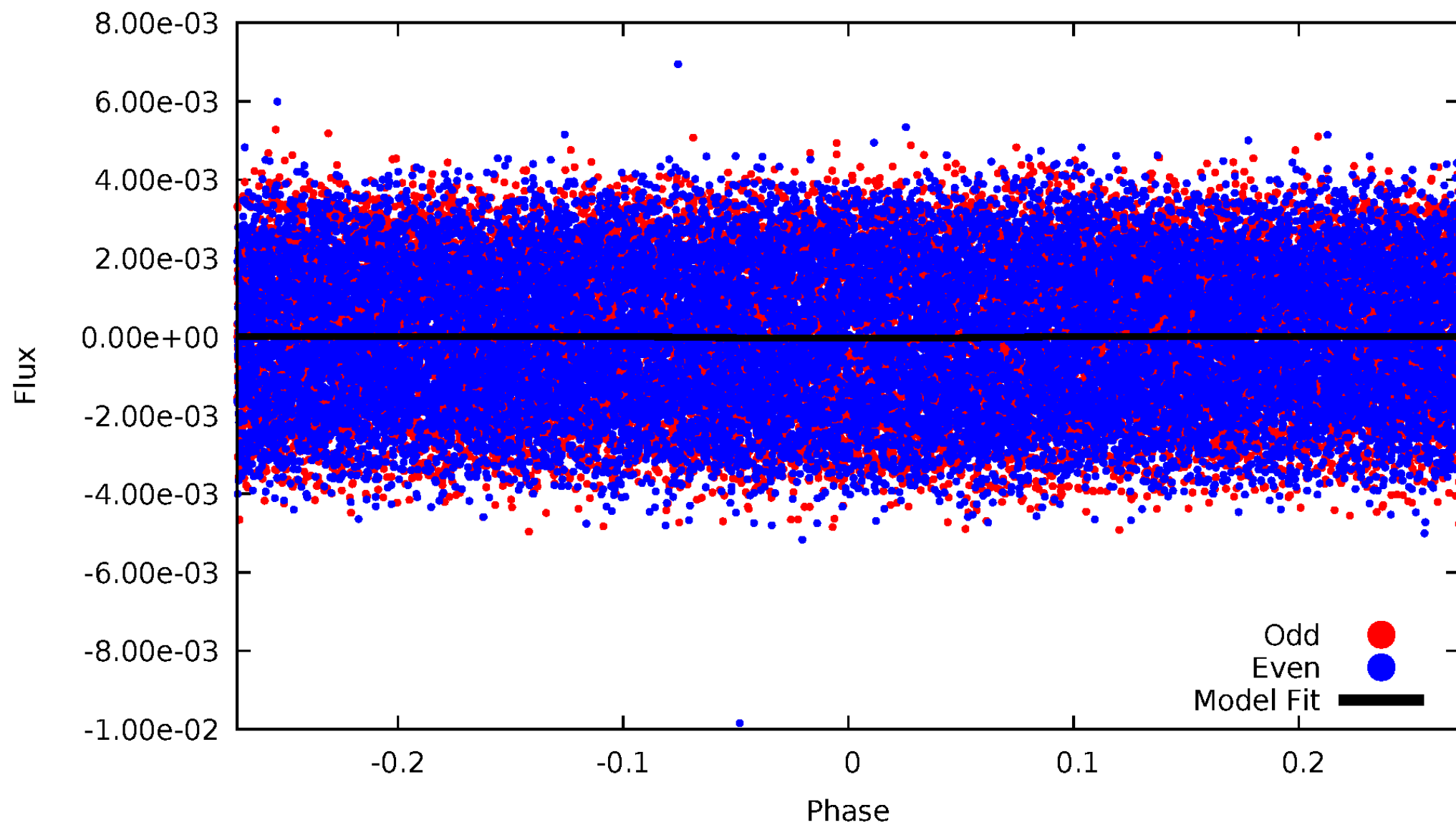
# DV Odd/Even

TCE 008510534-01

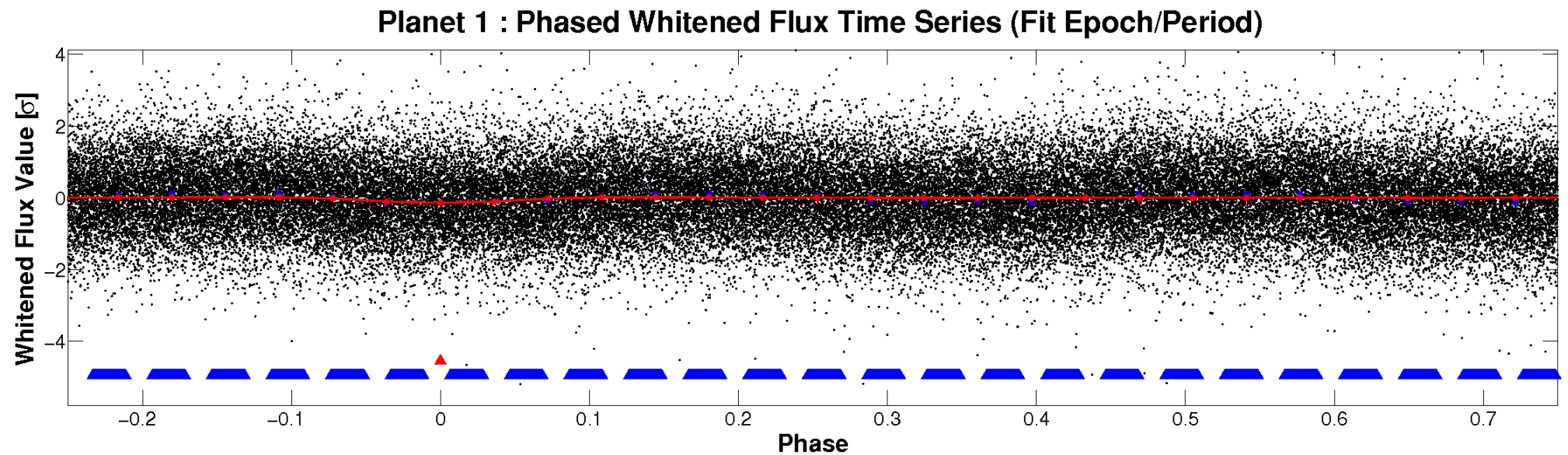
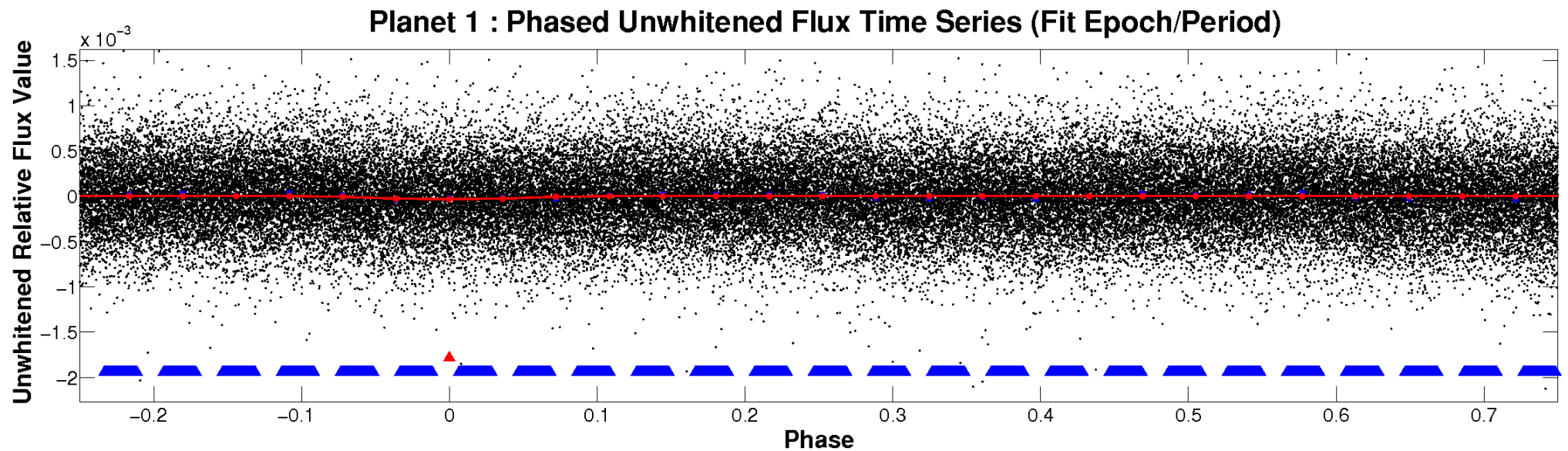


# ALT Odd/Even

TCE 008510534-01



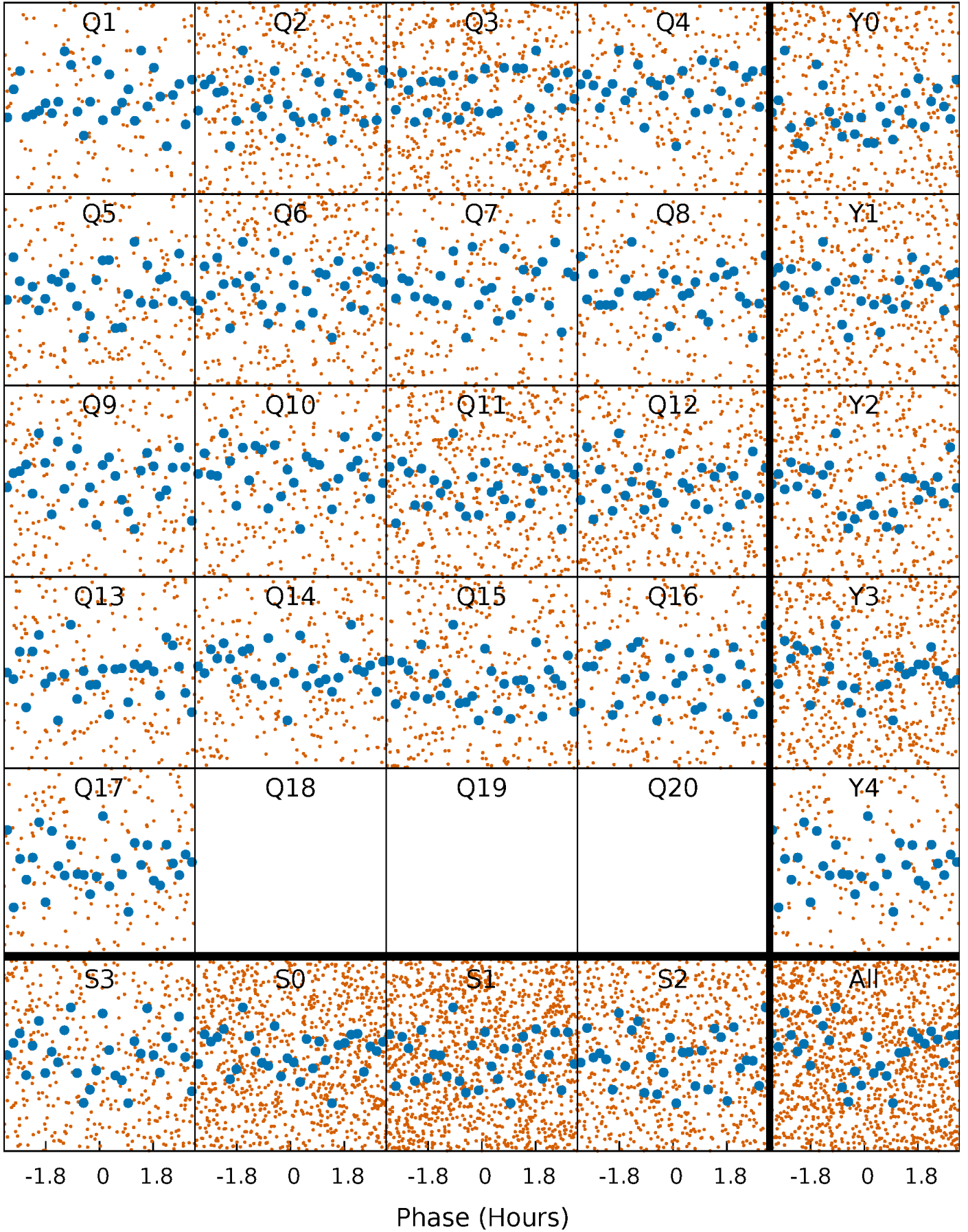
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

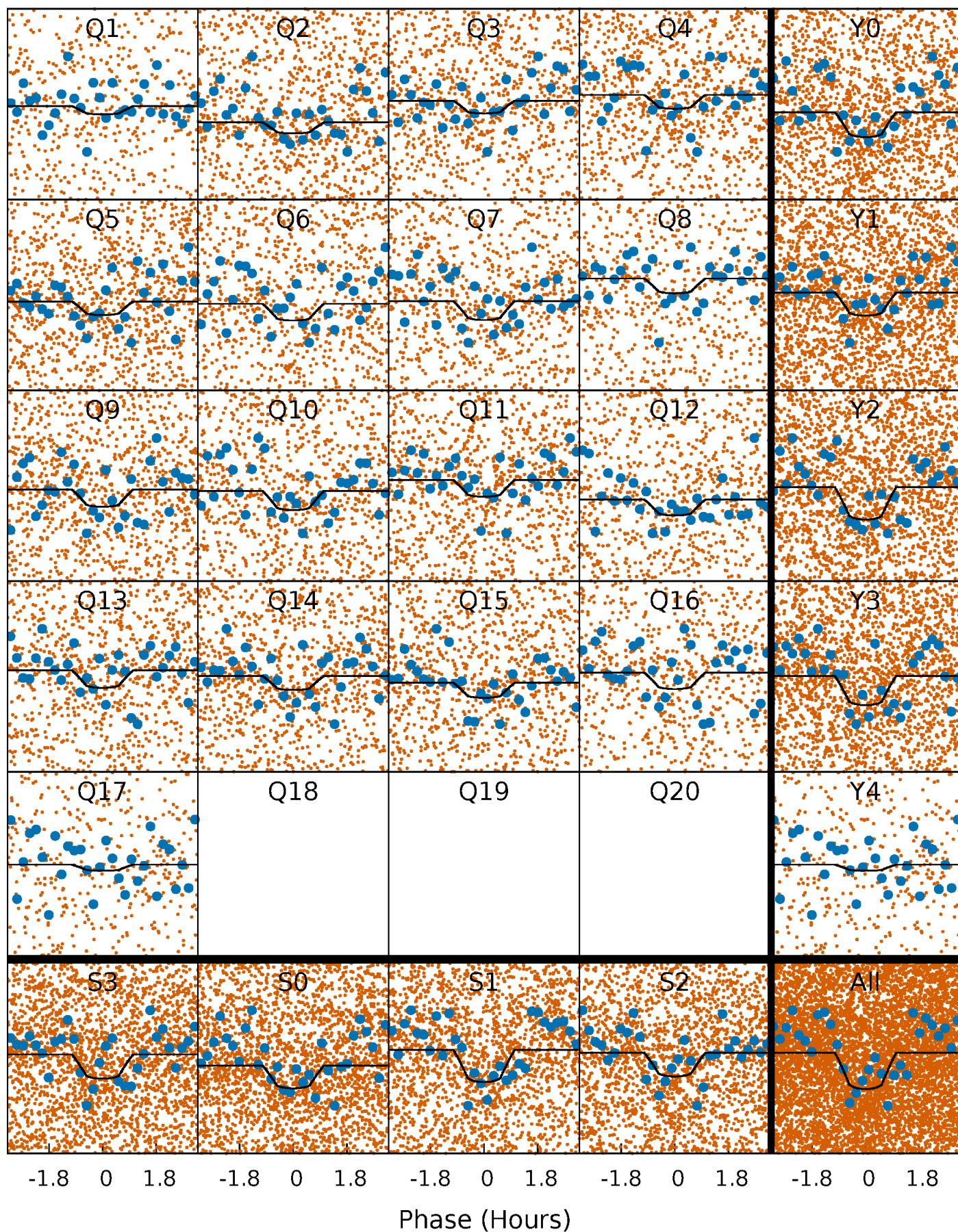
TCE 008510534-01   P= 0.566522 Days    $T_0=131.938989$  (BKJD)





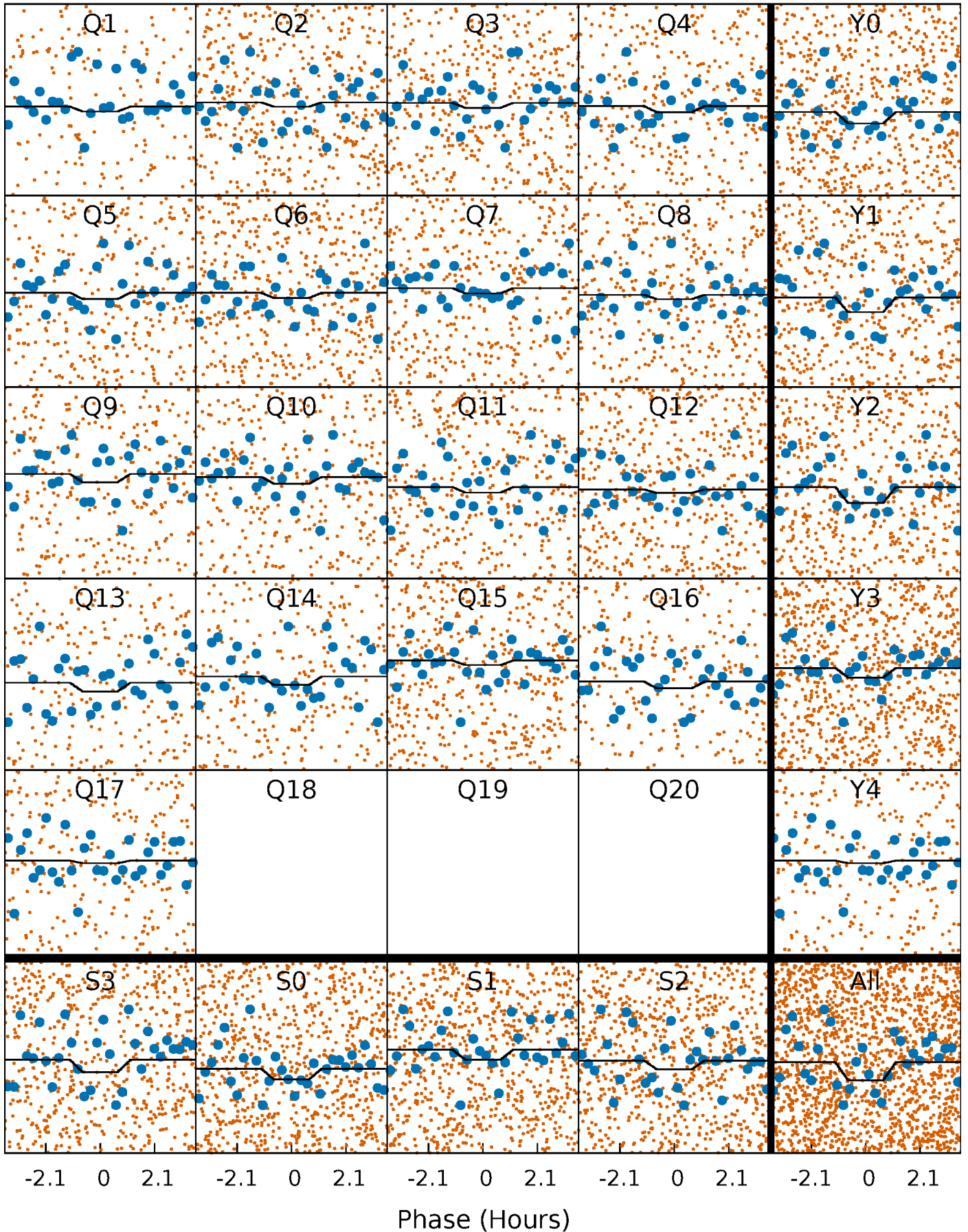
# DV Quarter-Phased Transit Curves

TCE 008510534-01 P= 0.566522 Days  $T_0=131.938989$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

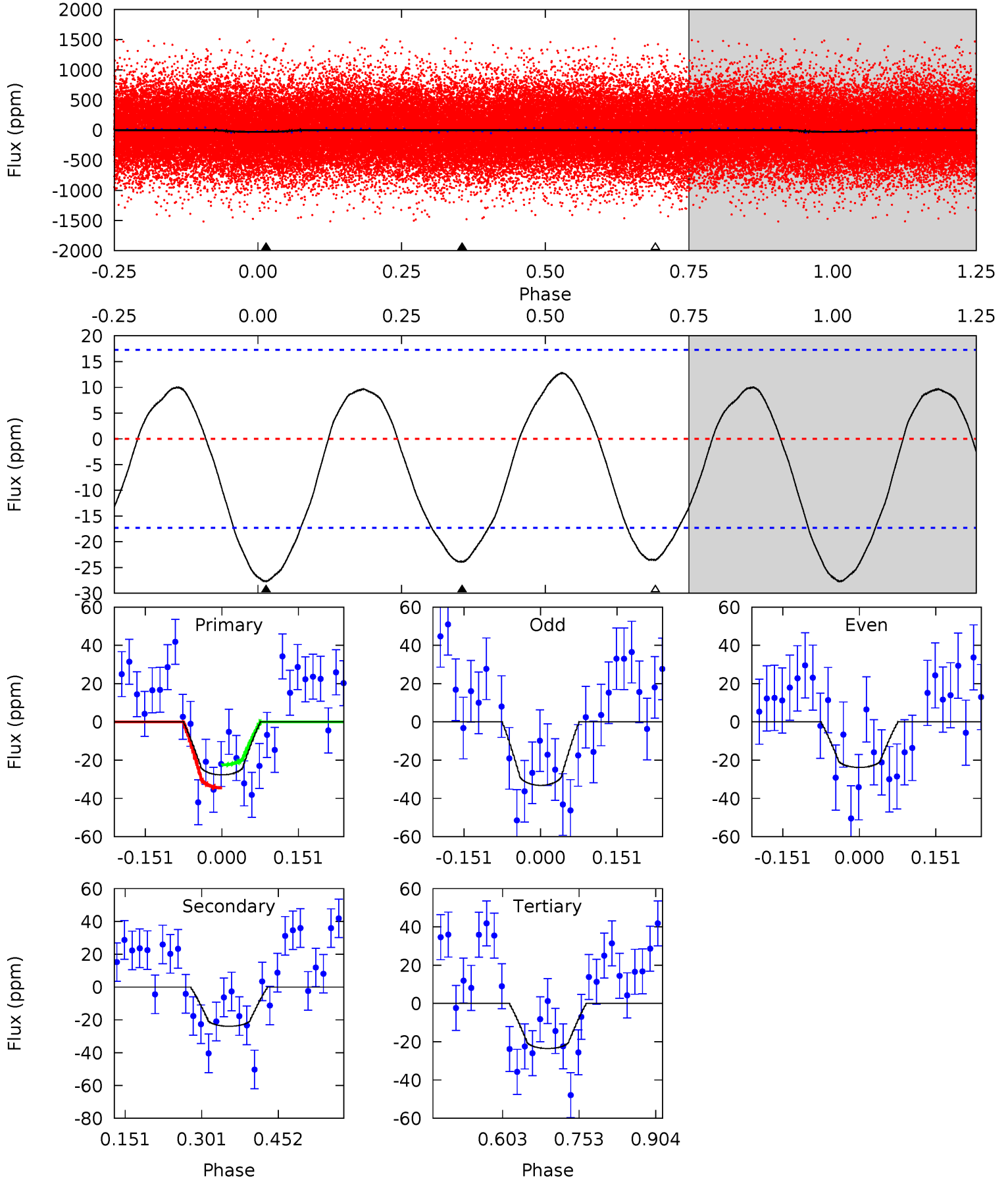
TCE 008510534-01 P= 0.566529 Days  $T_0=131.939300$  (BKJD)



# DV Model-Shift Uniqueness Test

008510534-01, P = 0.566522 Days, E = 131.372467 Days

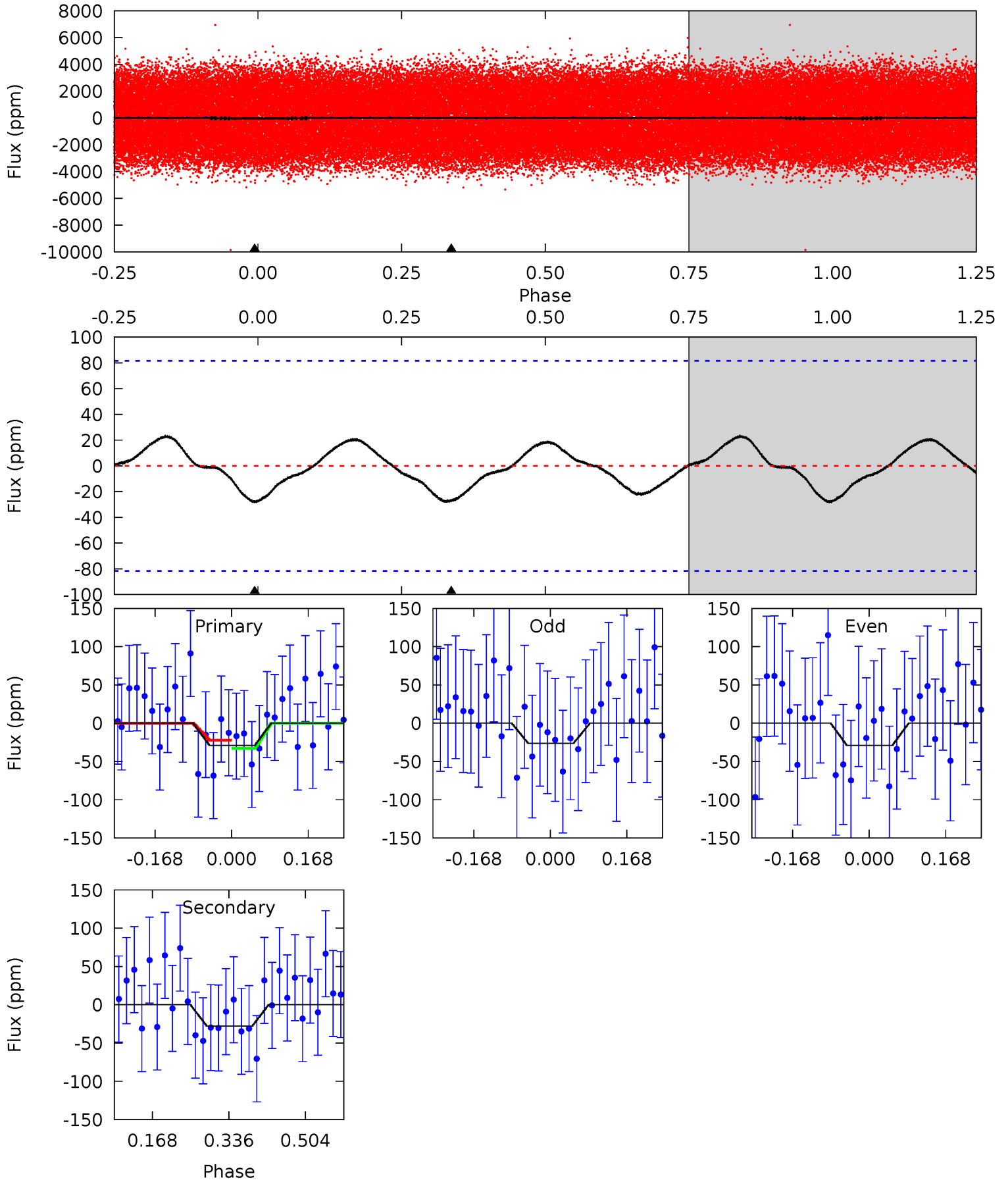
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.18	6.20	6.10	0	4.48	1.44	3.29	1.07	7.18	0.09	6.20	1.21	0.91	0.32	1.57



# Alt Model-Shift Uniqueness Test

008510534-01, P = 0.566529 Days, E = 131.372771 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.58	1.52	0	0	4.45	1.38	0.68	1.58	1.58	1.52	1.52	0.08	0.97	0.45	0.29





### Stellar Parameters For KIC 008510534

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7666^{+214}_{-322}$	$3.950^{+0.216}_{-0.144}$	$0.080^{+0.200}_{-0.350}$	$2.406^{+0.484}_{-0.727}$	$1.883^{+0.129}_{-0.362}$	$0.190^{+0.245}_{-0.074}$
	+3%/-4%	+5%/-4%	+250%/-438%	+20%/-30%	+7%/-19%	+129%/-39%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008510534-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	-24±4	$1.39^{+0.47}_{-0.44}$	$5665^{+373}_{-469}$	$6765^{+1833}_{-1176}$	$1.762^{+2.123}_{-0.787}$
Alt.	-28±18	$1.35^{+0.47}_{-0.44}$	$5651^{+382}_{-407}$	$7160^{+2648}_{-2269}$	$2.103^{+3.280}_{-1.455}$

$T_{max}$  = Theoretical Maximum Planetary Temperature  
 $T_{obs}$  = Observed Planetary Temperature (Assuming A=0.3)  
 $A_{obs}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

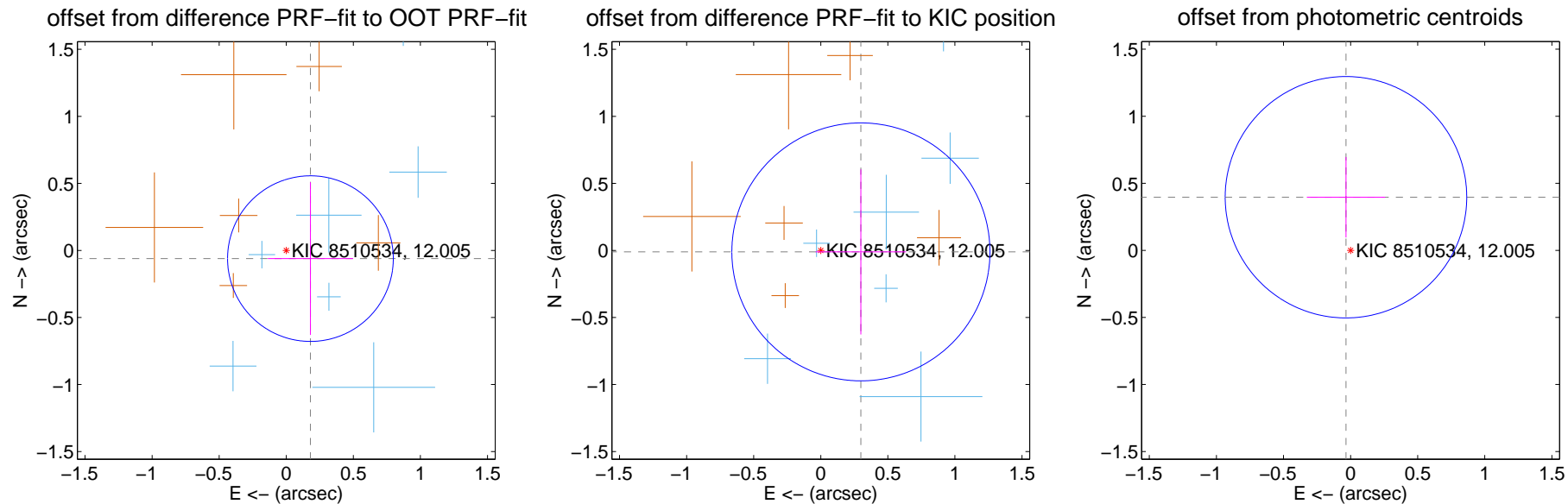
## DV Centroid Data

Supplemental centroid analysis for 008510534-01. Kepler magnitude: 12.01. Transit SNR 9.71

There are 8 quarters with good PRF difference image offsets

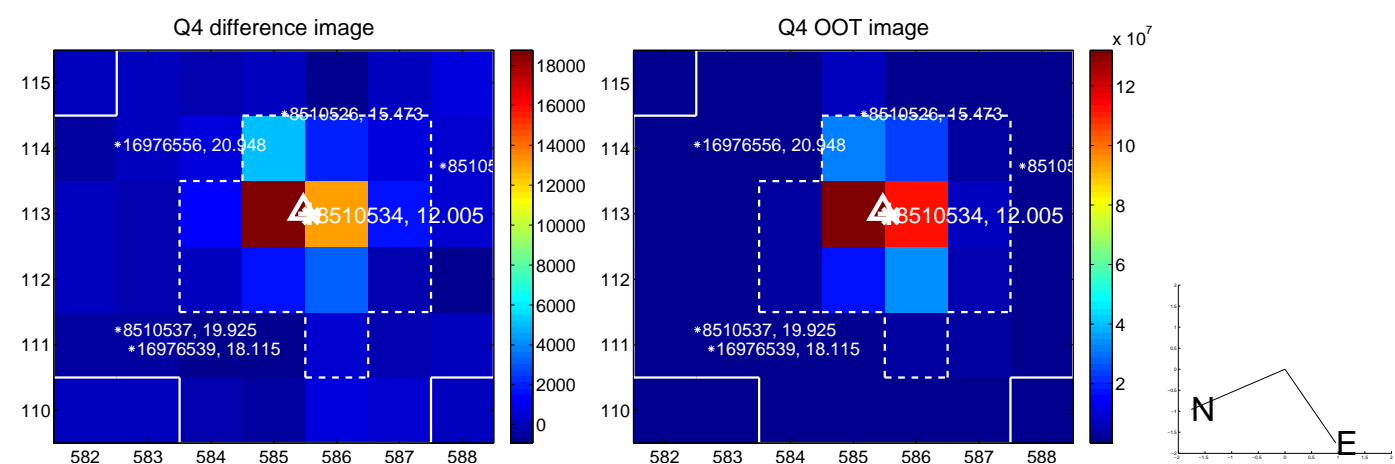
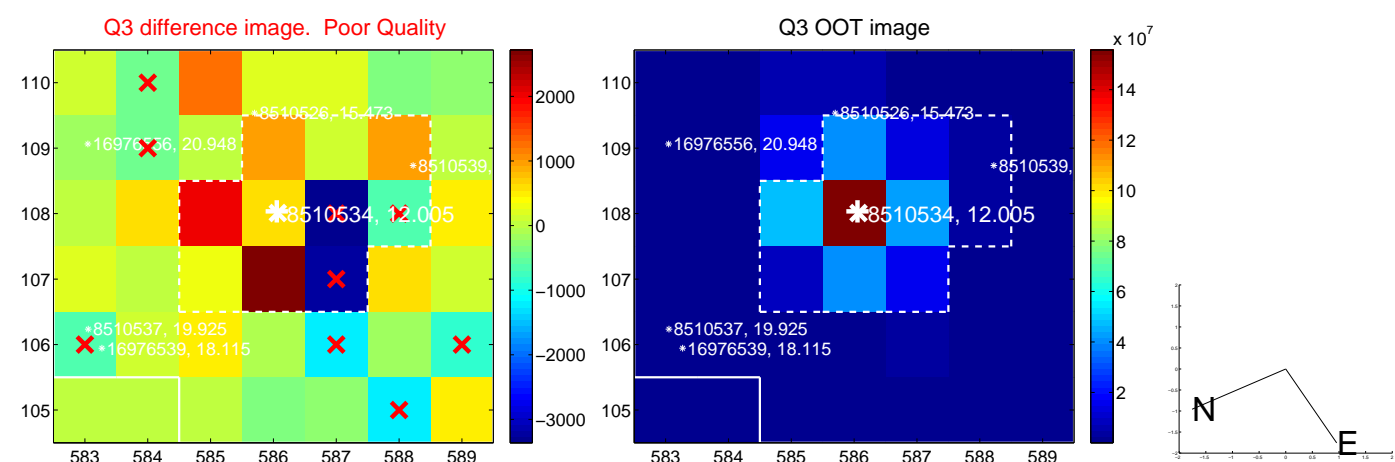
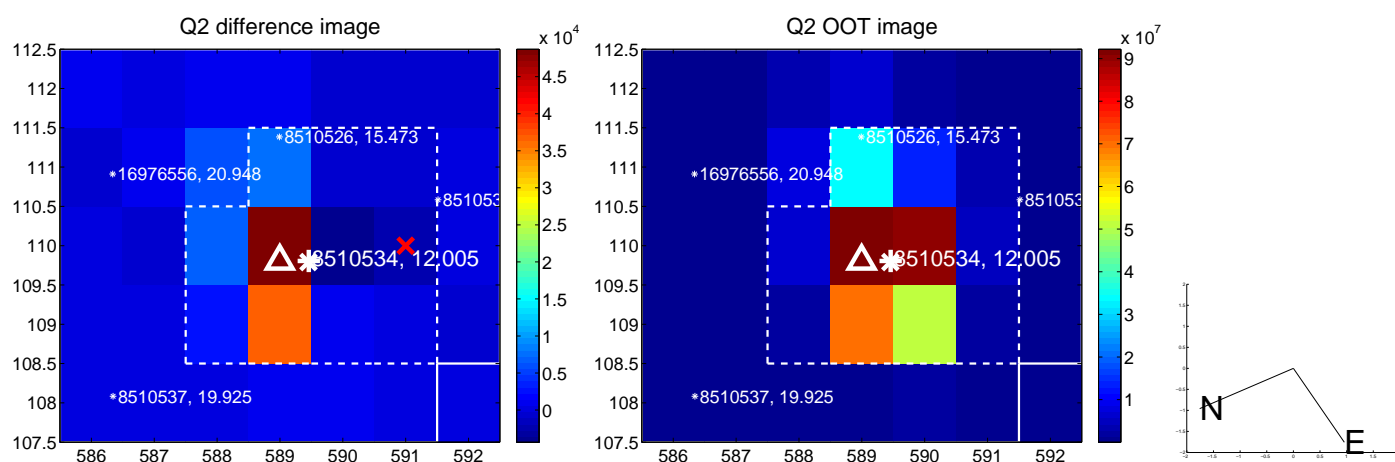
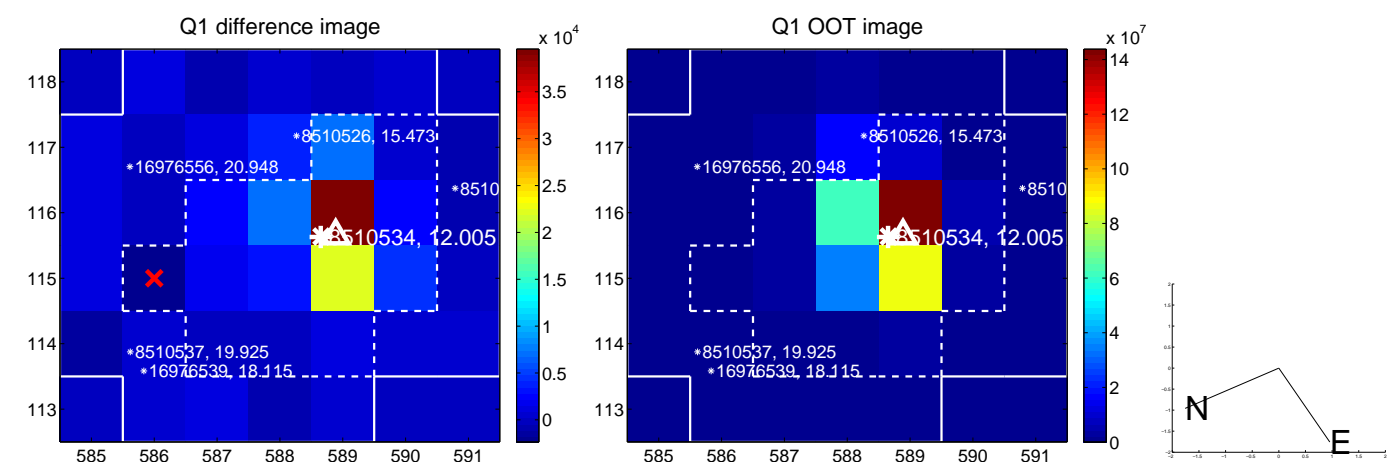
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.190 \pm 0.206$	0.92	$-0.180 \pm 0.318$	$-0.061 \pm 0.569$
PRF-fit source offset from KIC position	$0.299 \pm 0.321$	0.93	$-0.299 \pm 0.337$	$-0.011 \pm 0.616$
photometric centroid source offset	$0.40 \pm 0.30$	1.33	$0.03 \pm 0.29$	$0.40 \pm 0.30$

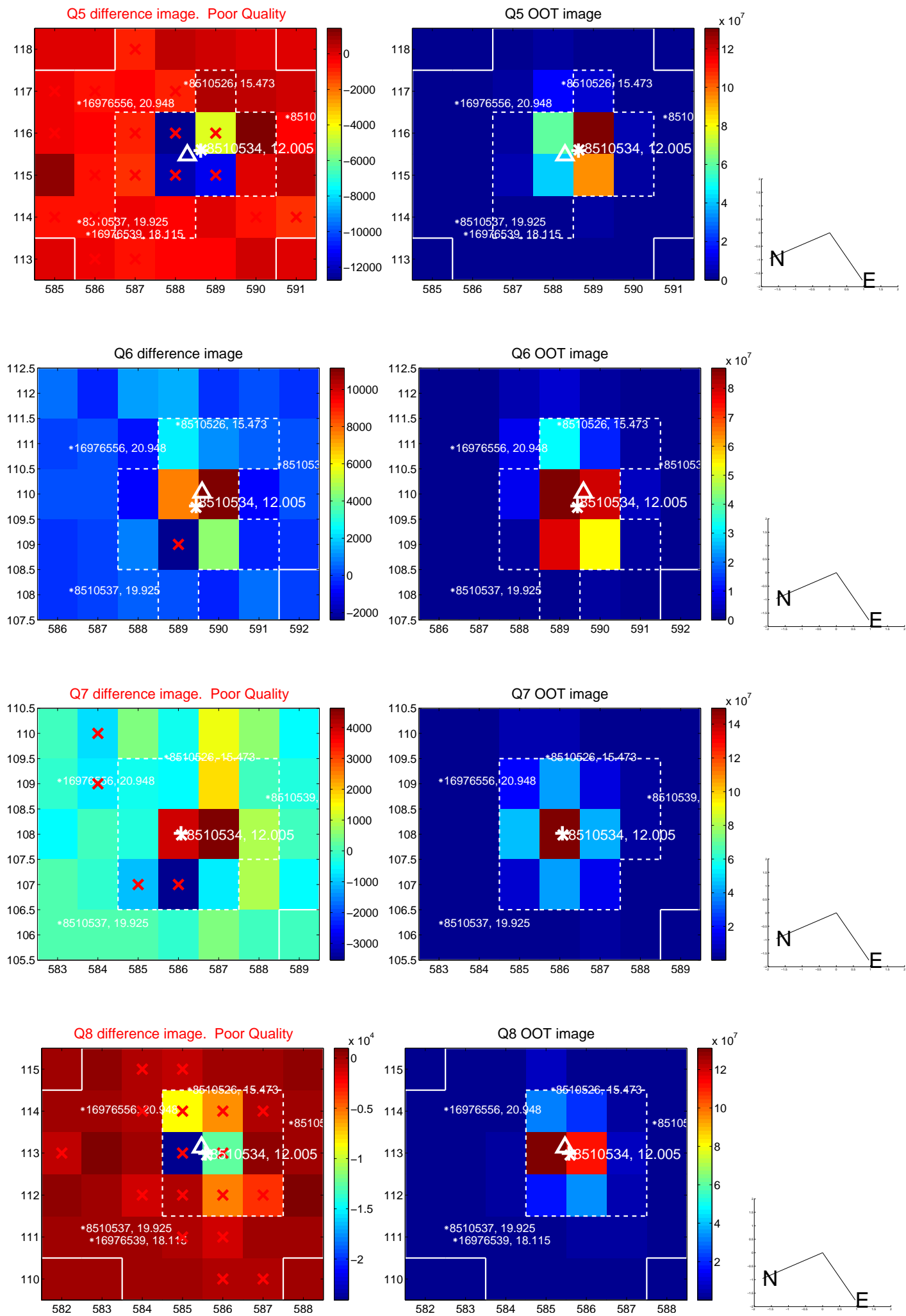


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

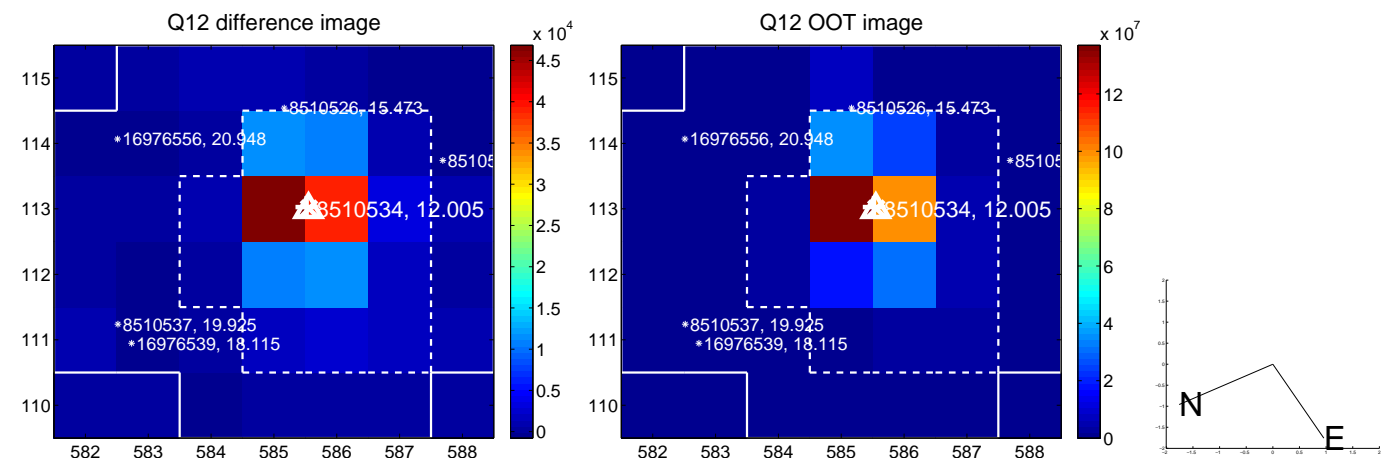
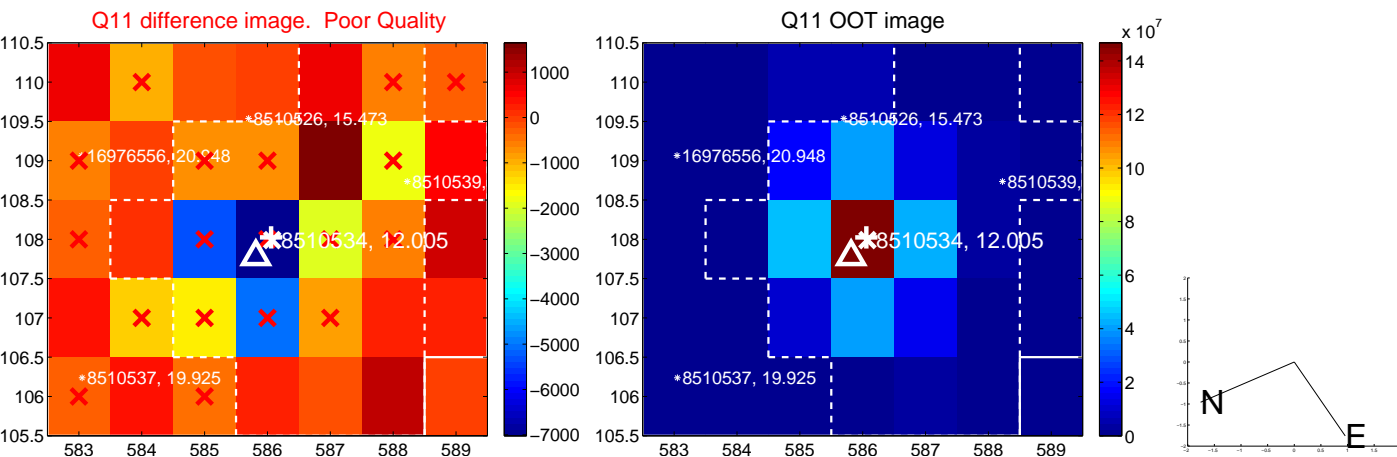
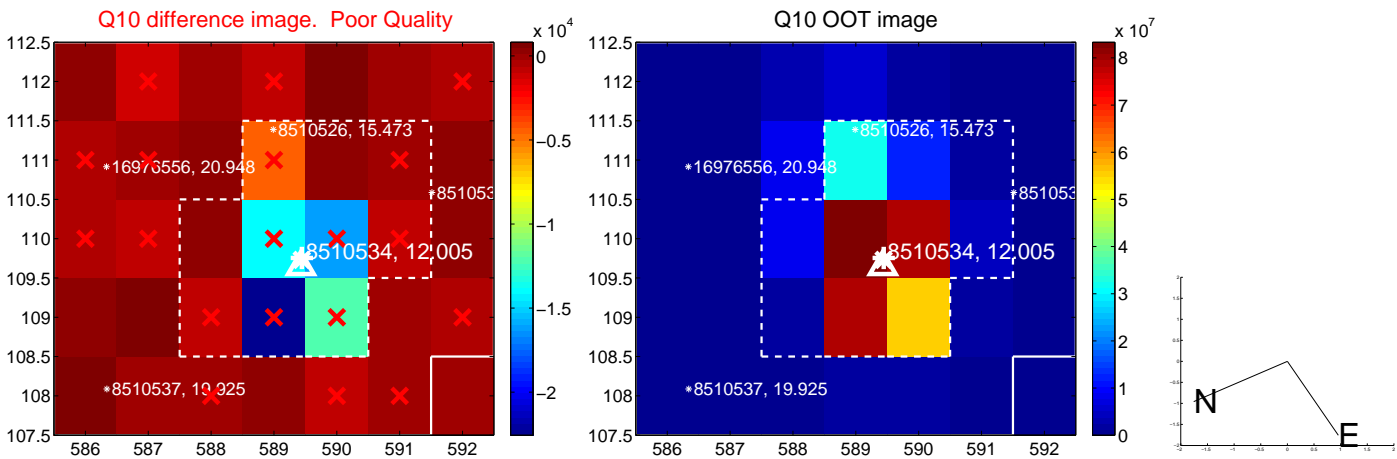
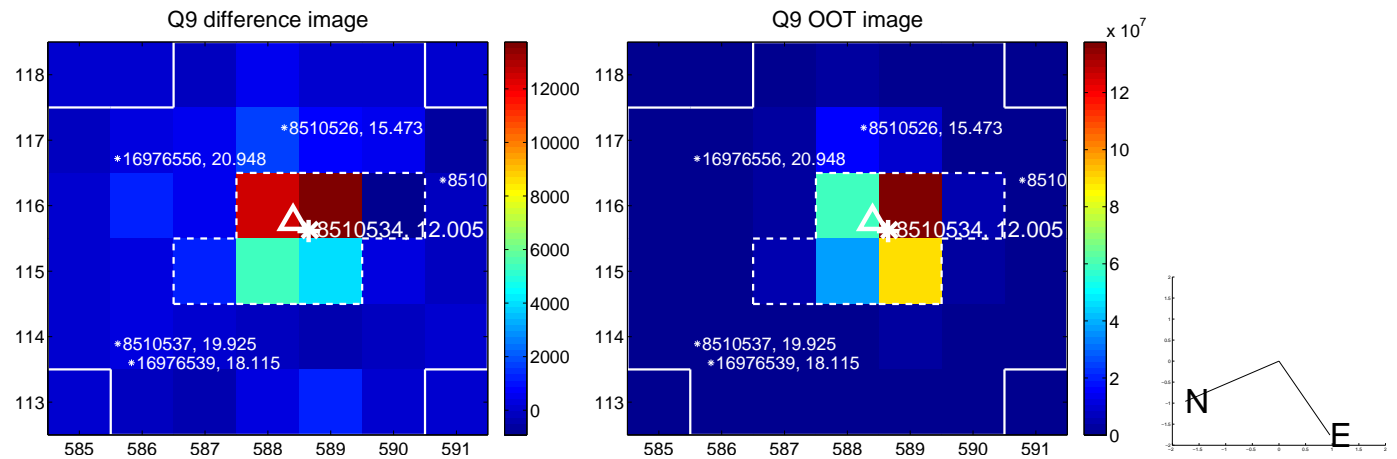


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

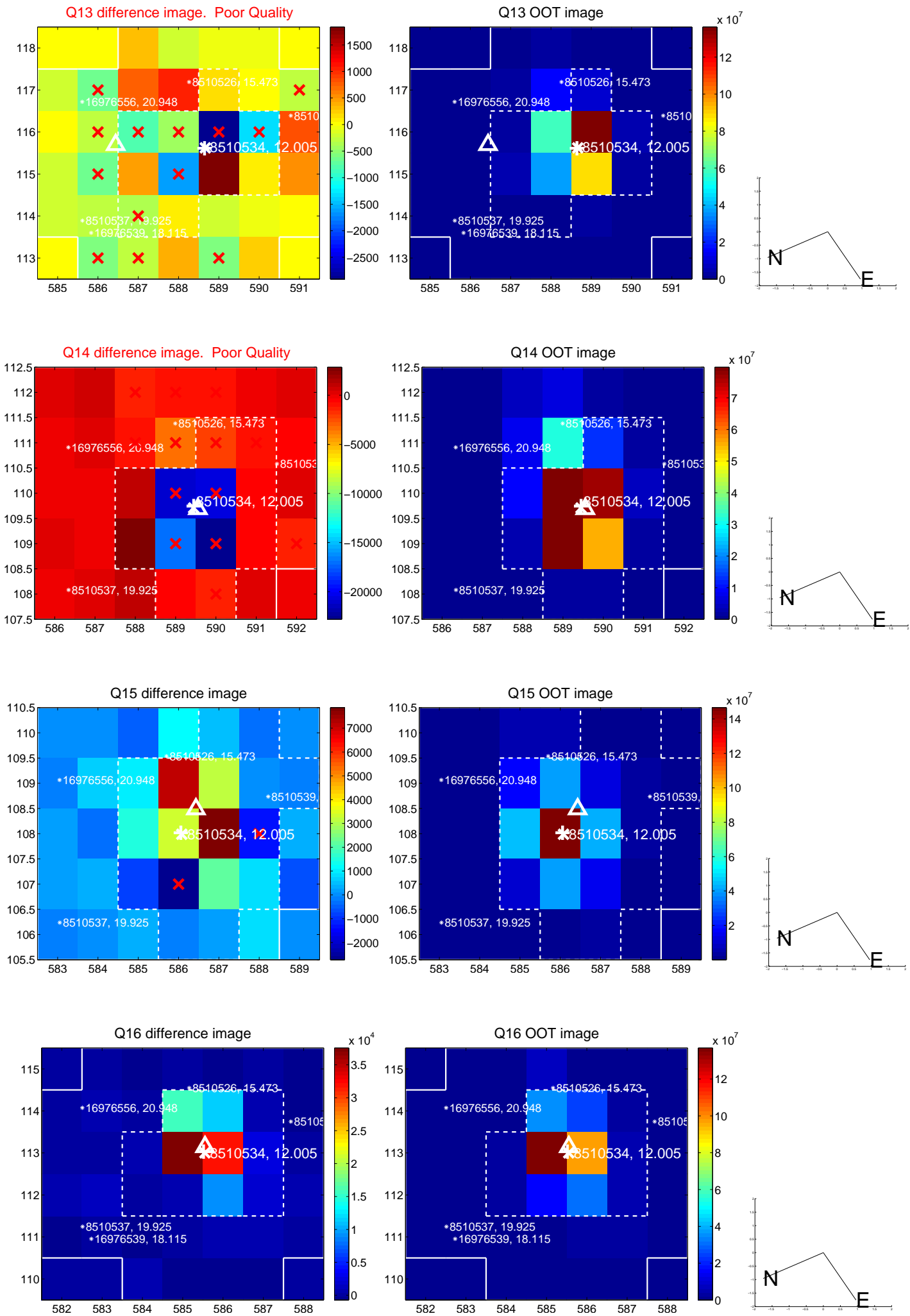




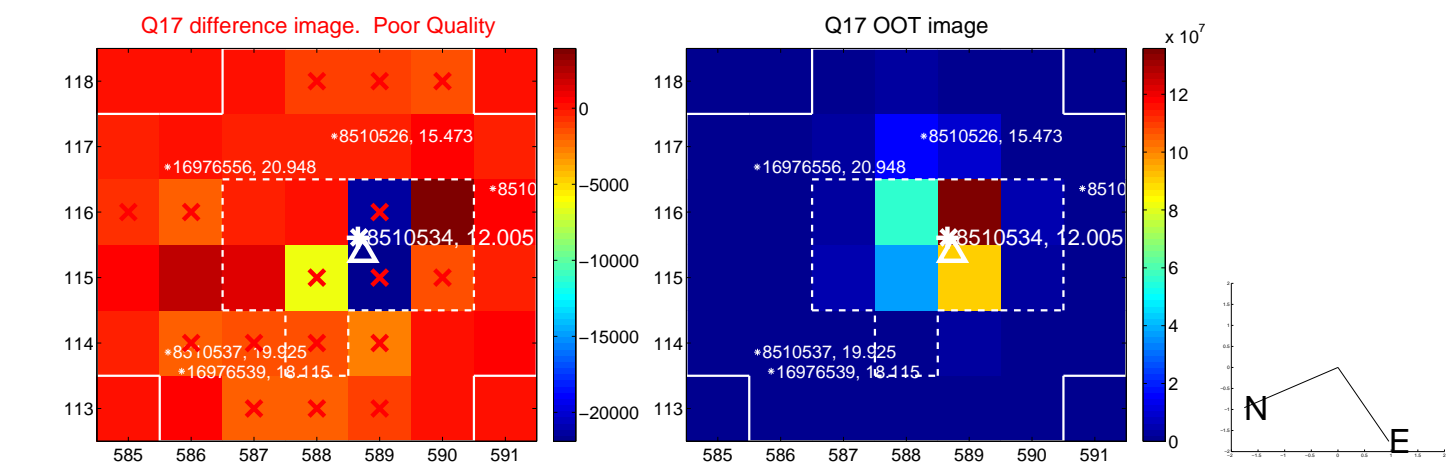
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



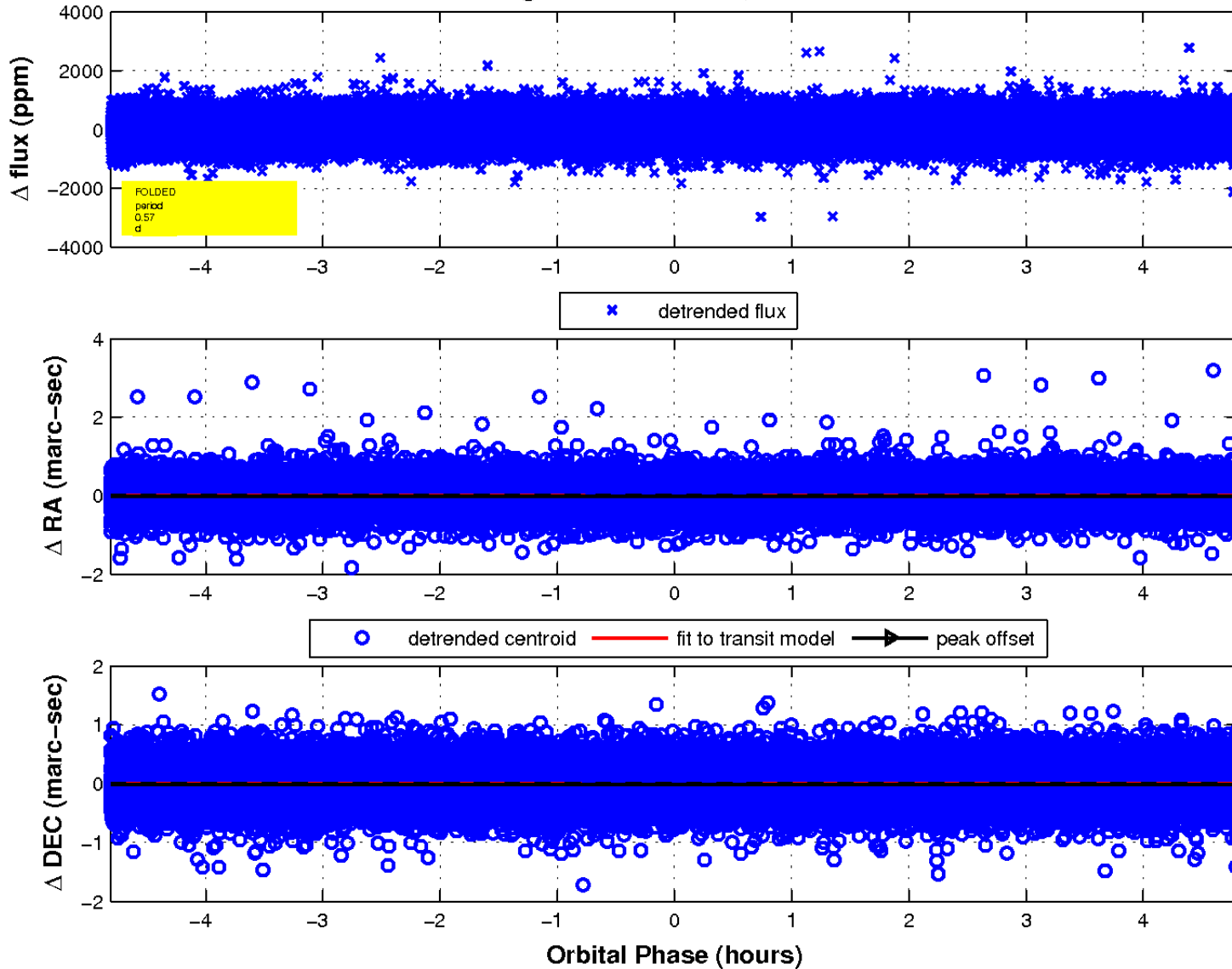
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

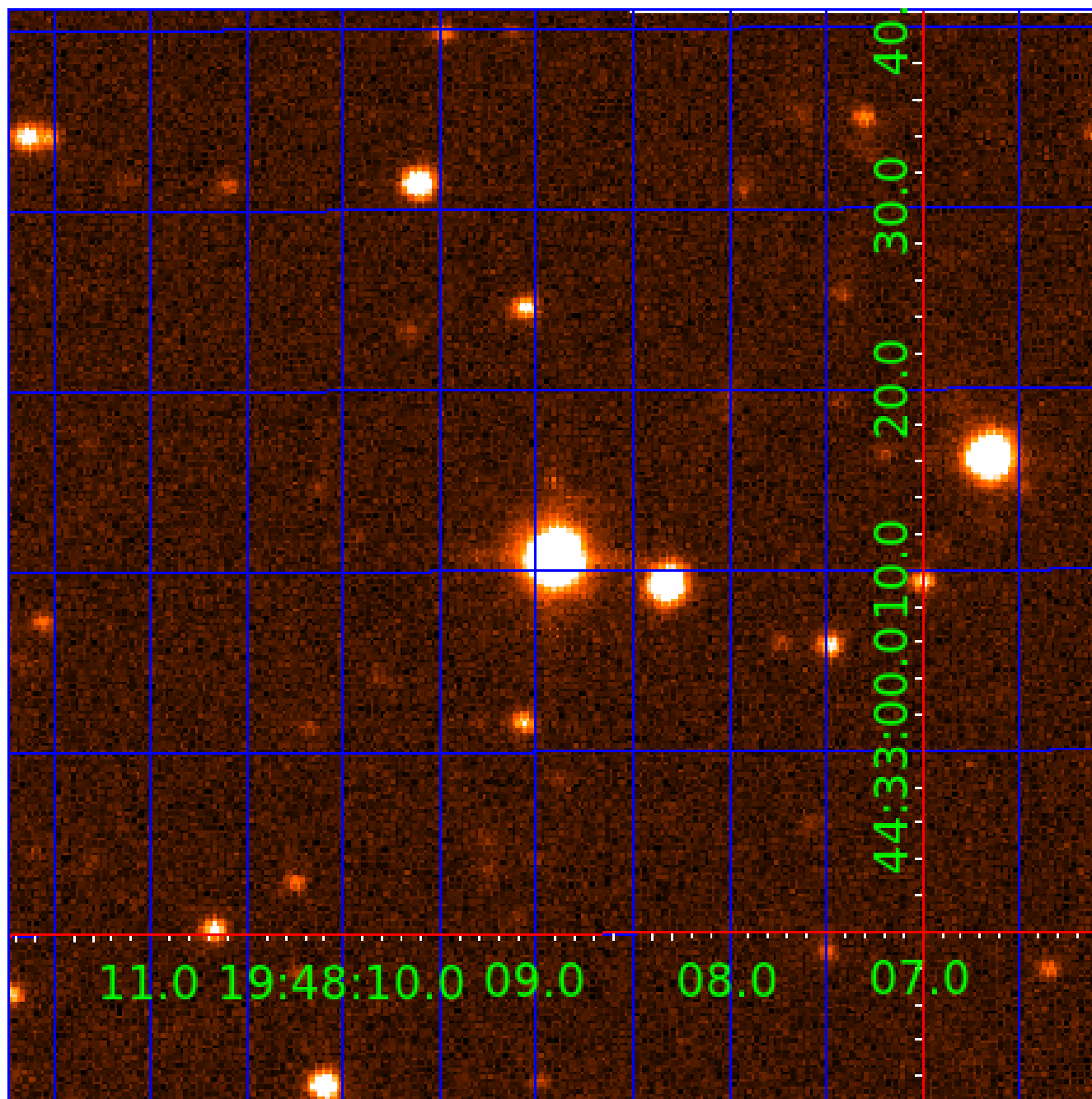


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 008510534

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008510534-01	OBS	No	0.566522	131.938989	31.6	1.604	10.5	9.7	2.41	7666	1.45	65425.09
008510534-02	OBS	No	0.611838	131.683306	39.5	2.283	8.0	9.4	2.41	7666	1.75	59045.16

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008510534-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
008510534-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

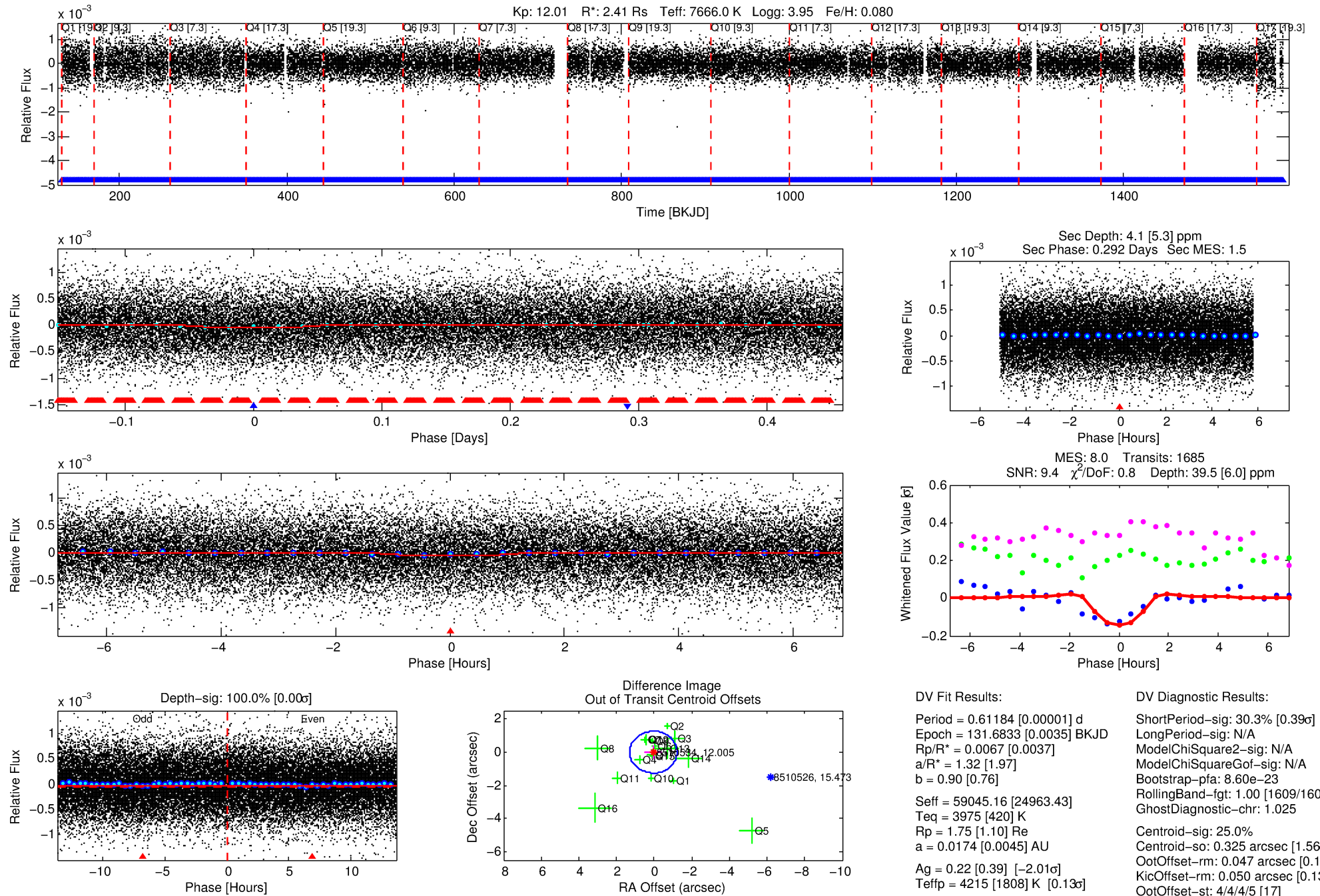
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008510534-02

No Significant Match Found

# DV One-Page Summary

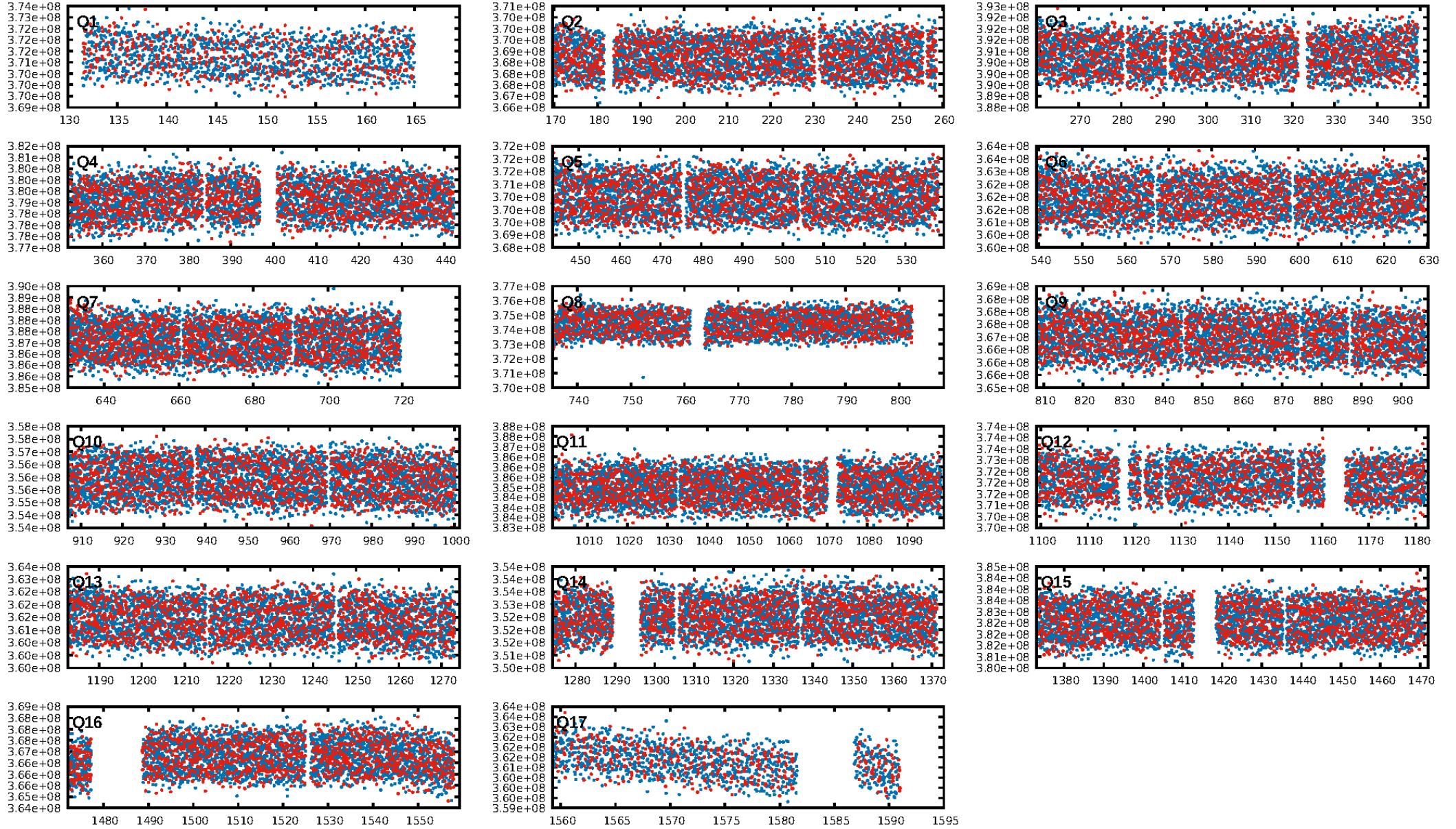
KIC: 8510534 Candidate: 2 of 2 Period: 0.612 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:54:40 Z

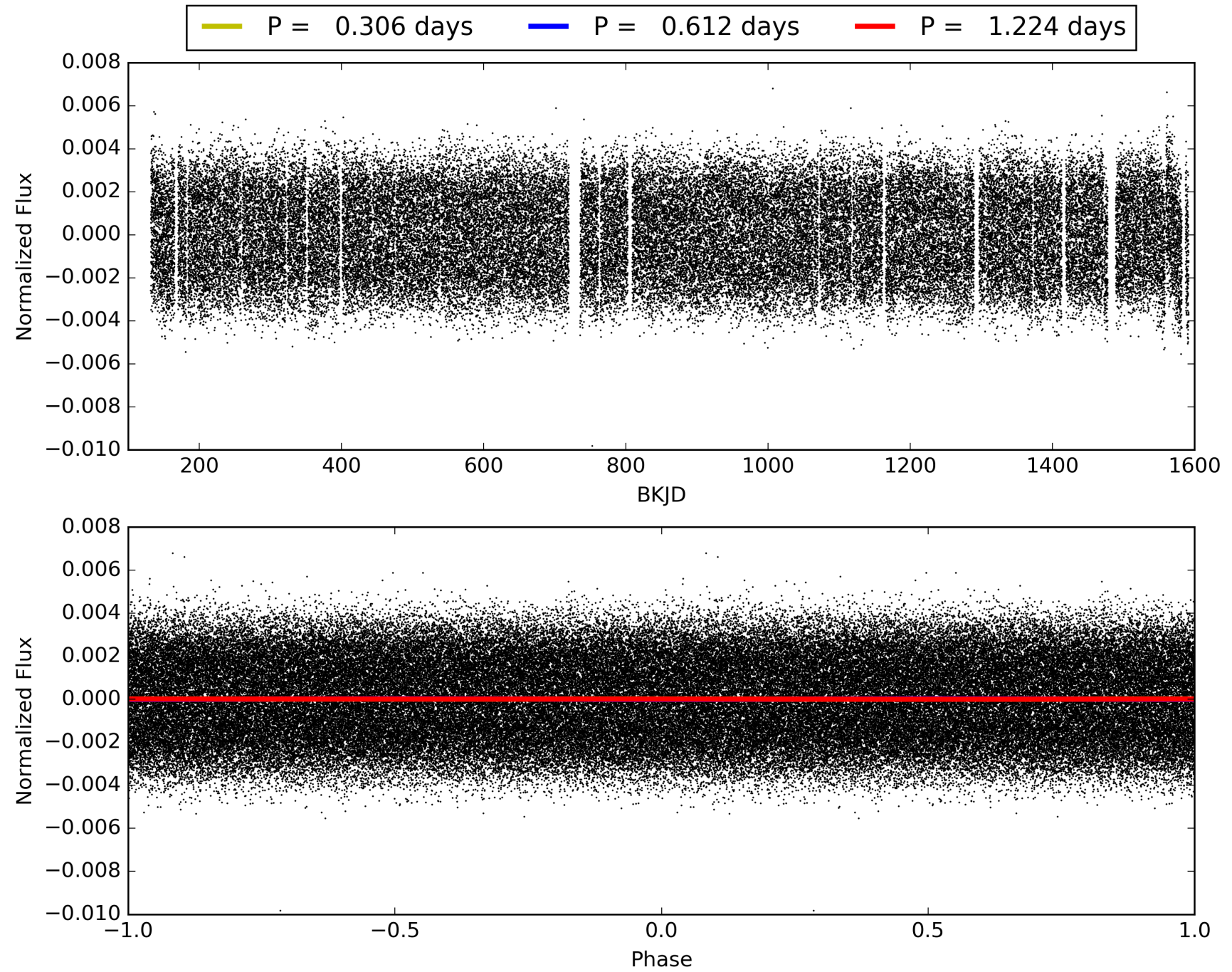
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008510534-02, PDC Light Curves





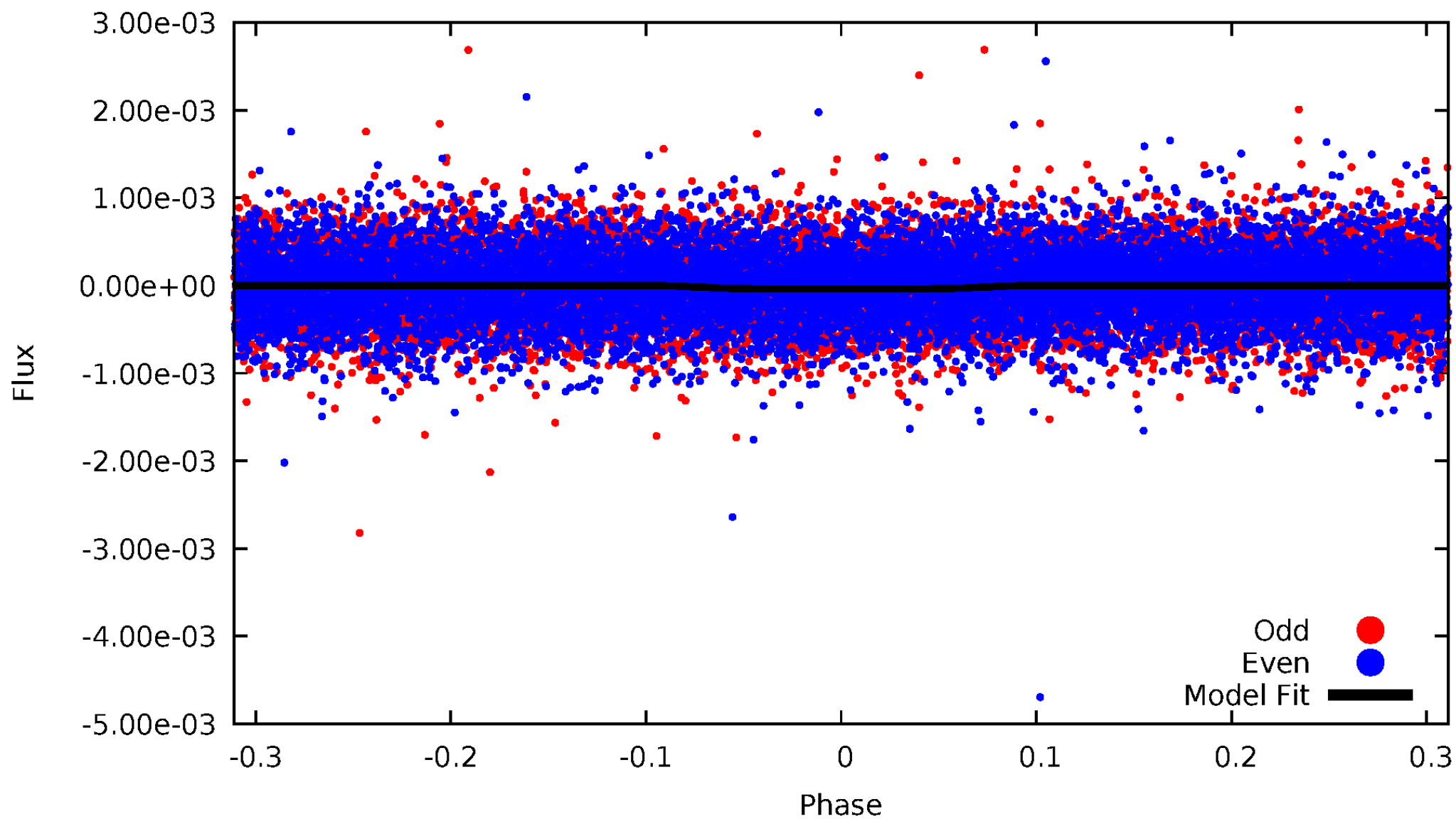
# TCE 008510534-02





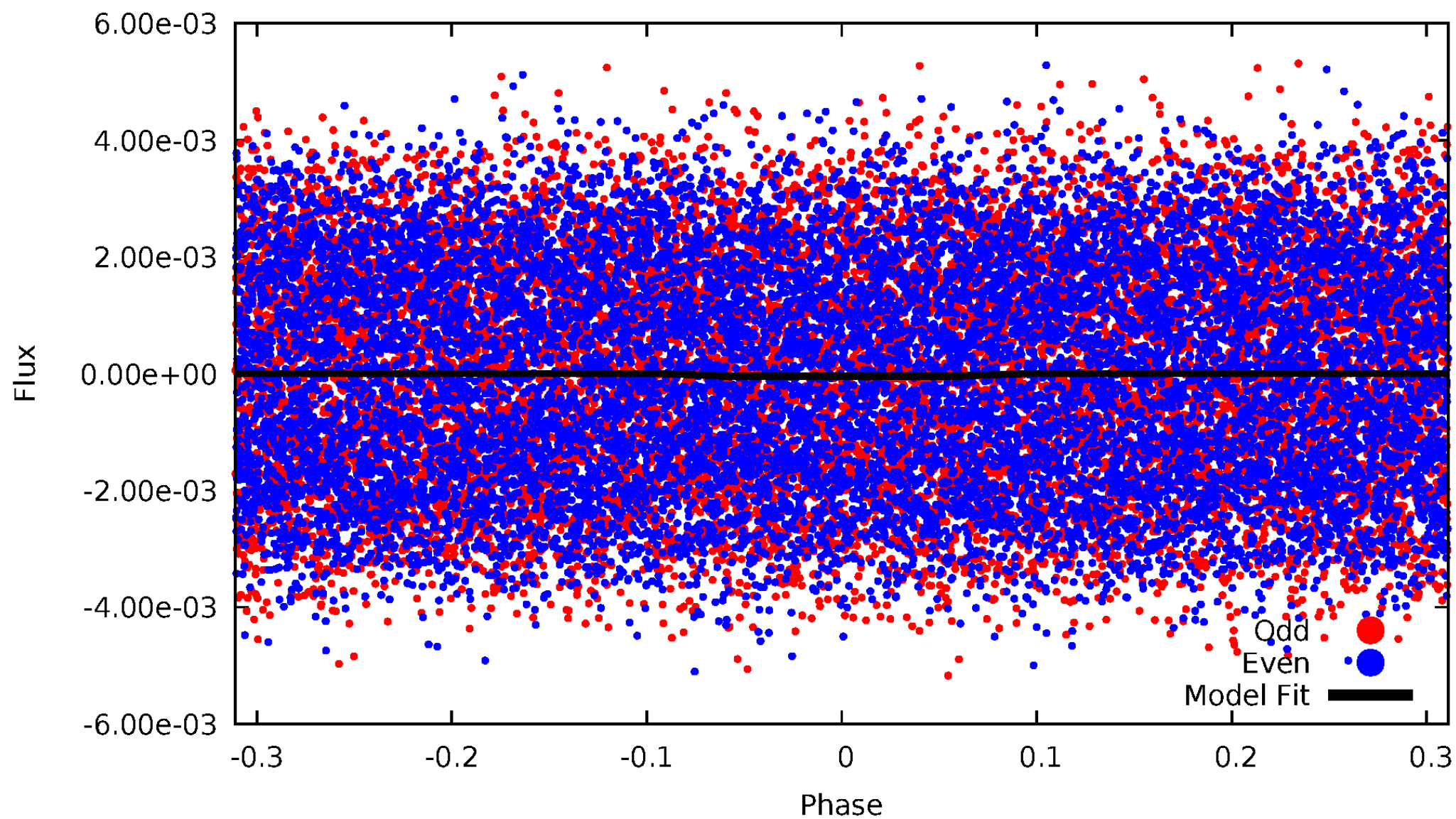
# DV Odd/Even

TCE 008510534-02



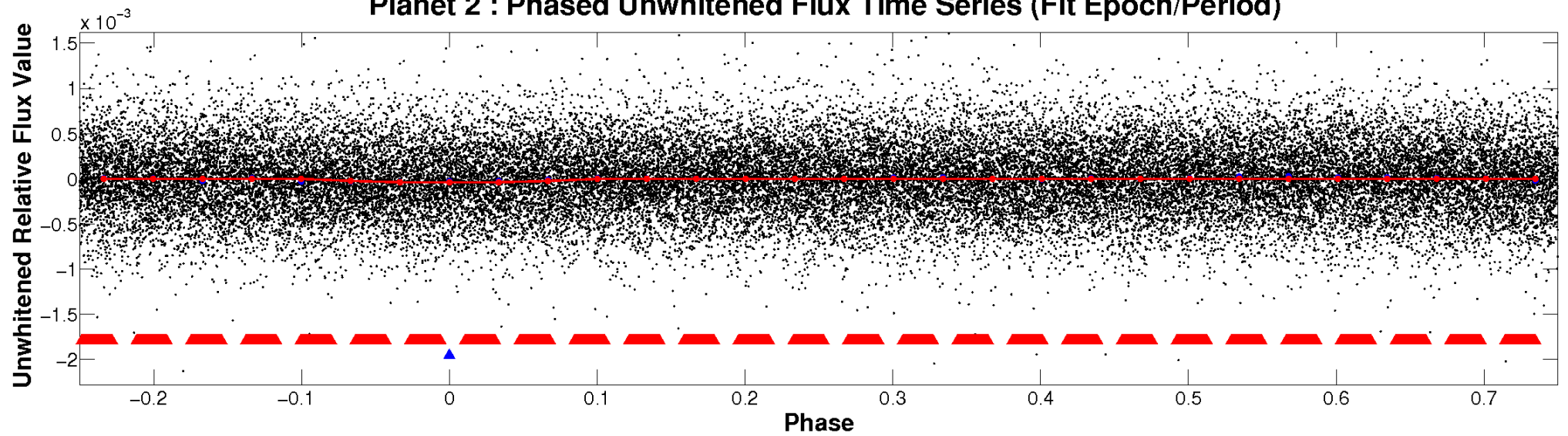
# ALT Odd/Even

TCE 008510534-02

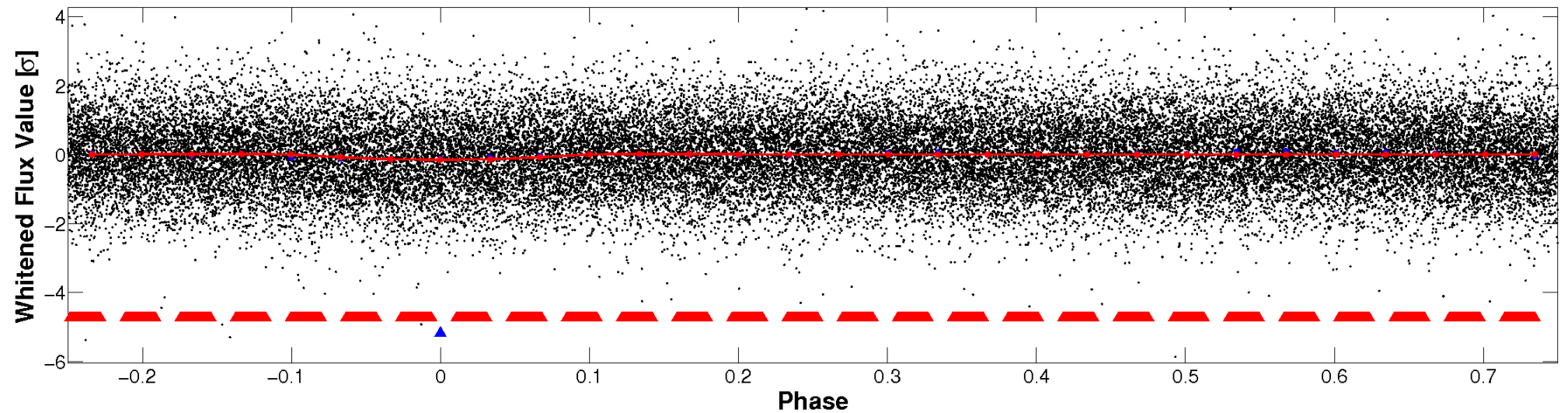


# Non-Whitened Vs. Whitened Light Curve

## Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

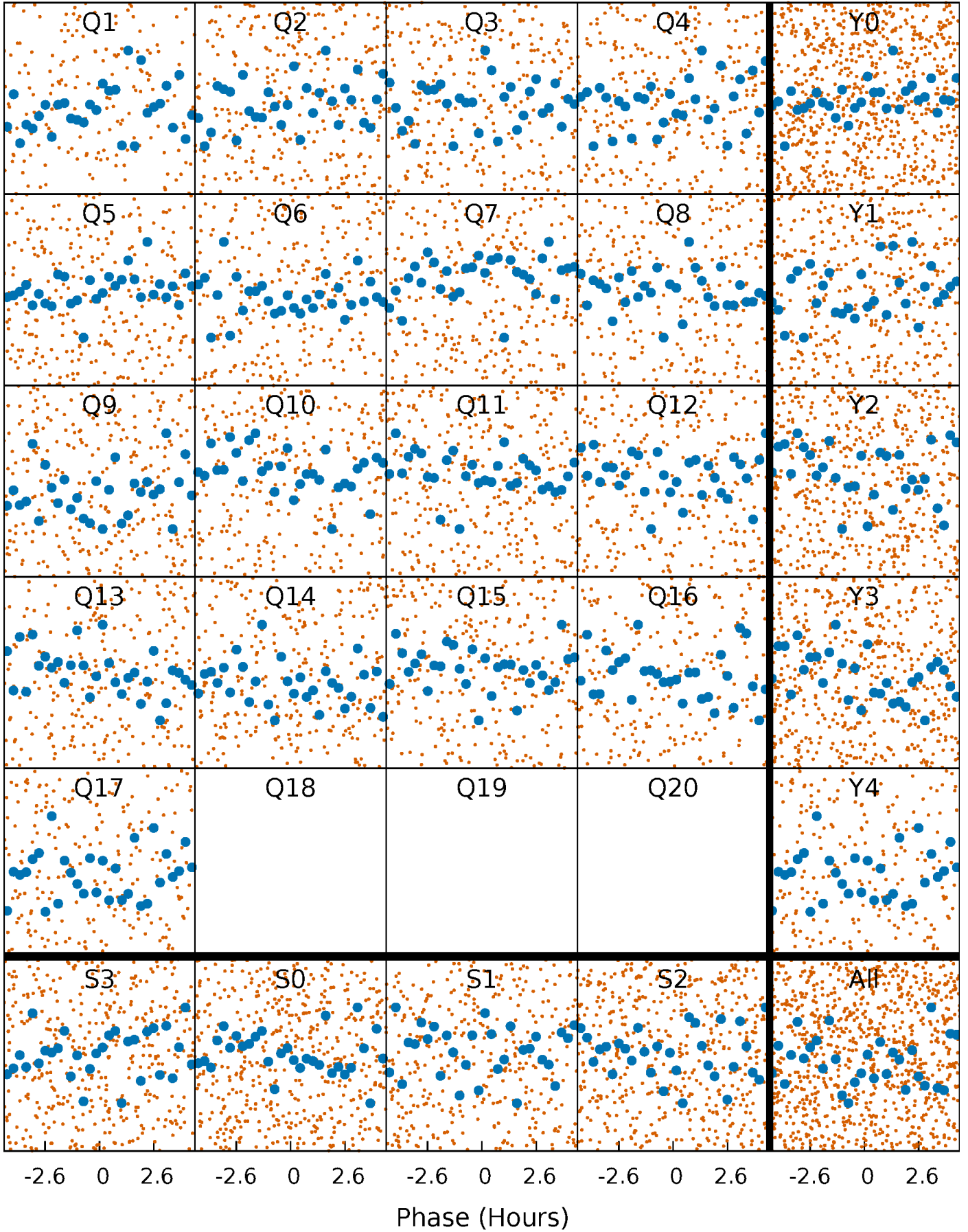


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

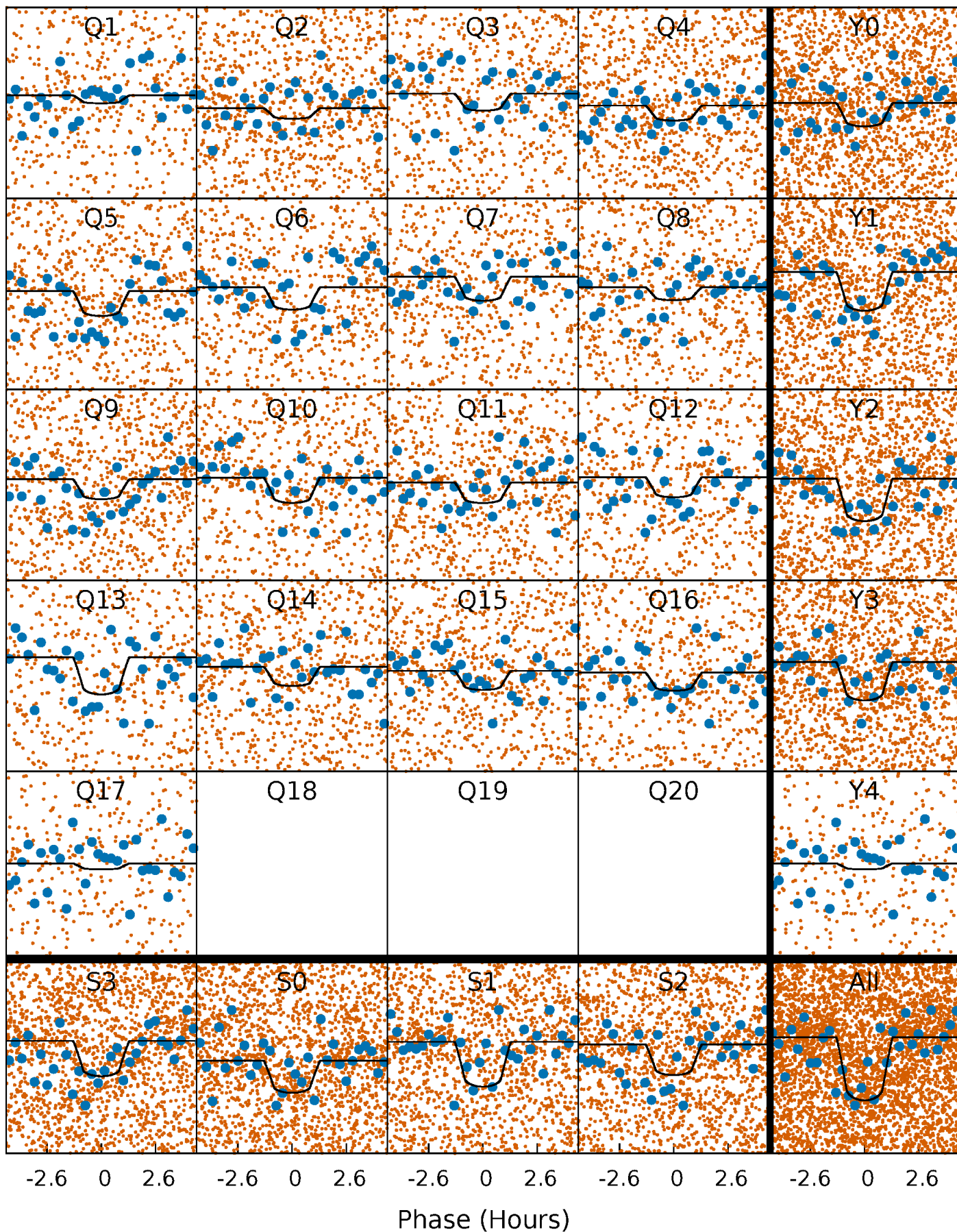
TCE 008510534-02   P= 0.611838 Days    $T_0=131.683306$  (BKJD)





# DV Quarter-Phased Transit Curves

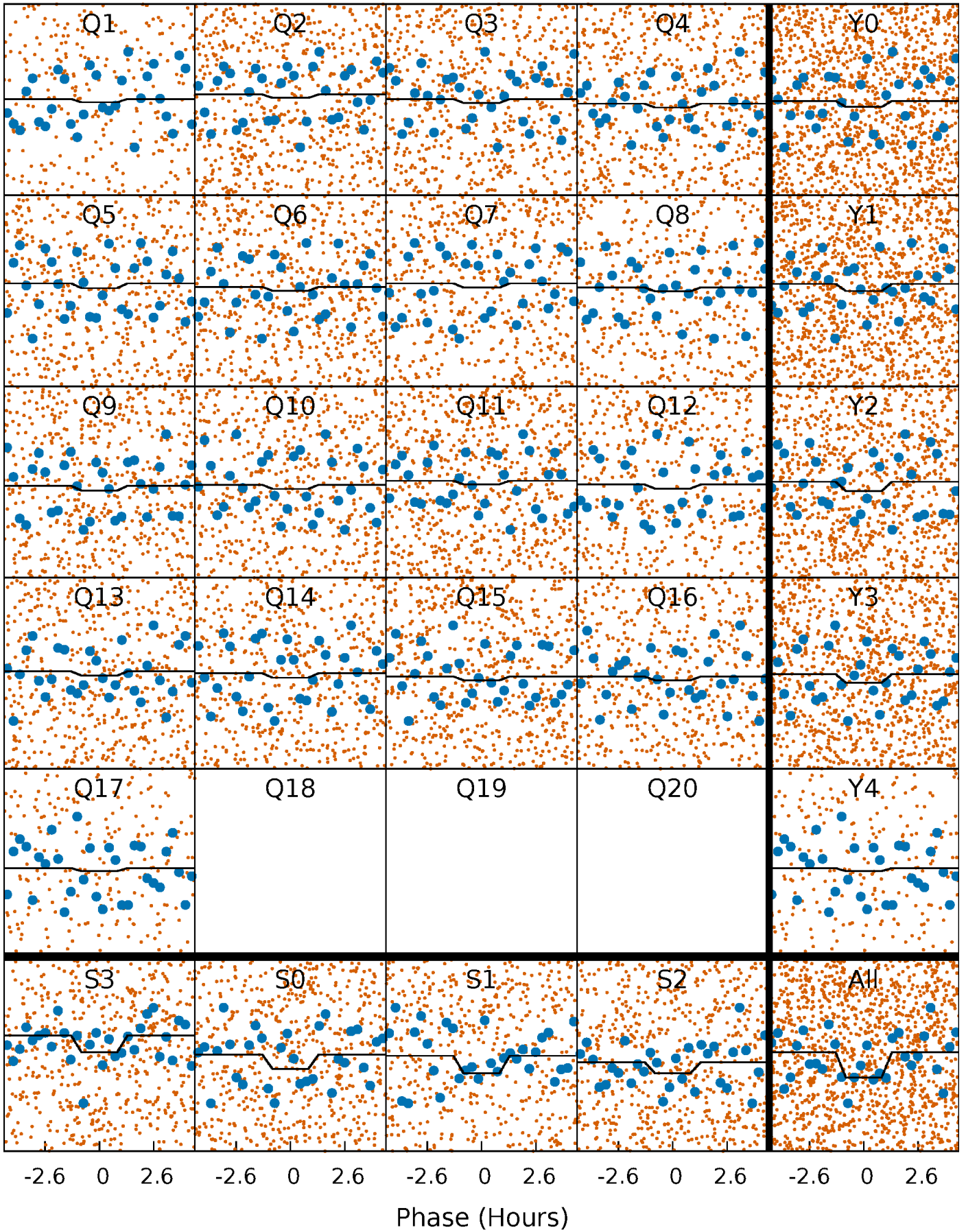
TCE 008510534-02 P= 0.611838 Days  $T_0=131.683306$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

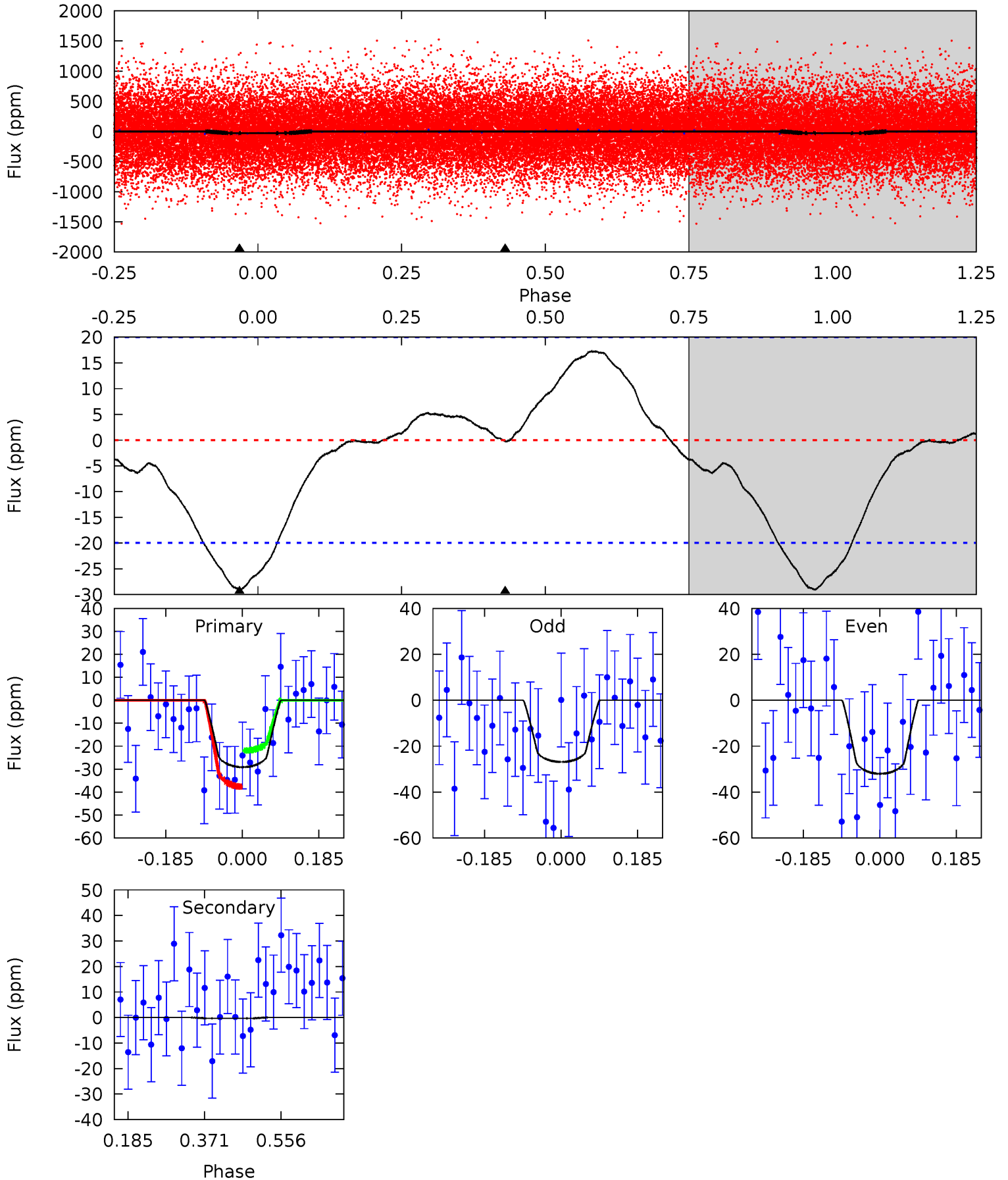
TCE 008510534-02   P= 0.611838 Days    $T_0=131.683306$  (BKJD)



# DV Model-Shift Uniqueness Test

008510534-02, P = 0.611838 Days, E = 131.071468 Days

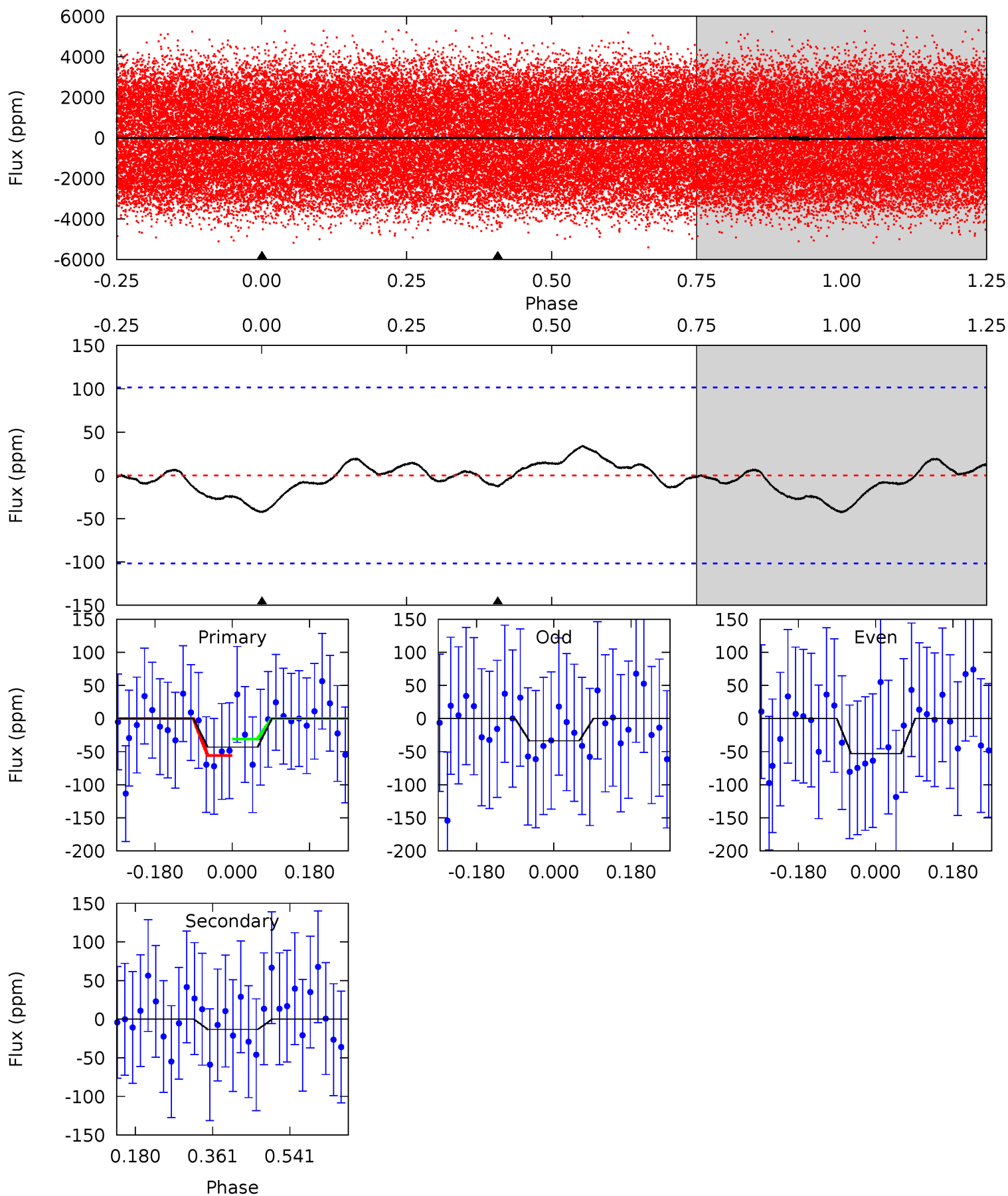
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.47	0.08	0	0	4.43	1.32	1.23	6.47	6.47	0.08	0.08	0.57	0.81	0.37	1.73



# Alt Model-Shift Uniqueness Test

008510534-02, P = 0.611838 Days, E = 131.071468 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.89	0.58	0	0	4.44	1.34	0.38	1.89	1.89	0.58	0.58	0.42	1.22	0.45	0.55



### Stellar Parameters For KIC 008510534

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7666^{+214}_{-322}$	$3.950^{+0.216}_{-0.144}$	$0.080^{+0.200}_{-0.350}$	$2.406^{+0.484}_{-0.727}$	$1.883^{+0.129}_{-0.362}$	$0.190^{+0.245}_{-0.074}$
	+3%/-4%	+5%/-4%	+250%/-438%	+20%/-30%	+7%/-19%	+129%/-39%
Source	KIC0	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008510534-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-0 \pm 5$	$1.64^{+1.05}_{-0.92}$	$5505^{+368}_{-442}$	$-4524^{+8636}_{-828}$	$0.020^{+0.459}_{-0.332}$
Alt.	$-13 \pm 23$	$1.73^{+1.04}_{-0.85}$	$5494^{+381}_{-441}$	$4384^{+3587}_{-10033}$	$0.574^{+2.596}_{-1.029}$

$T_{max}$  = Theoretical Maximum Planetary Temperature  
 $T_{obs}$  = Observed Planetary Temperature (Assuming A=0.3)  
 $A_{obs}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

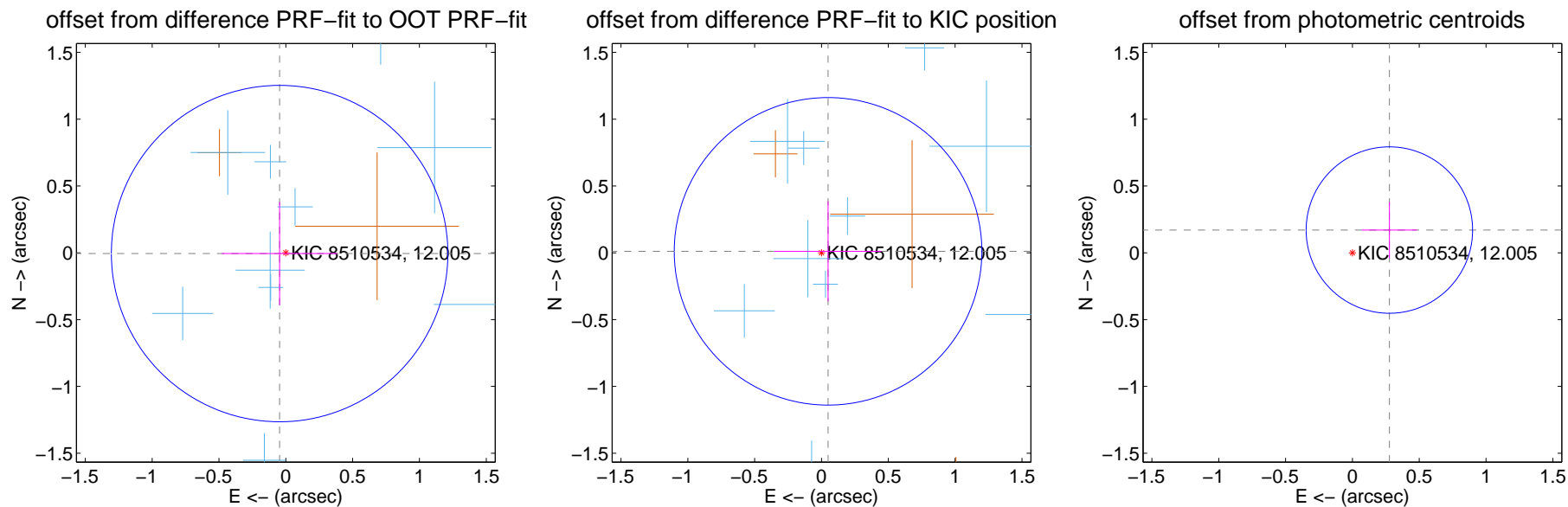
## DV Centroid Data

Supplemental centroid analysis for 008510534-02. Kepler magnitude: 12.01. Transit SNR 9.38

There are 11 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

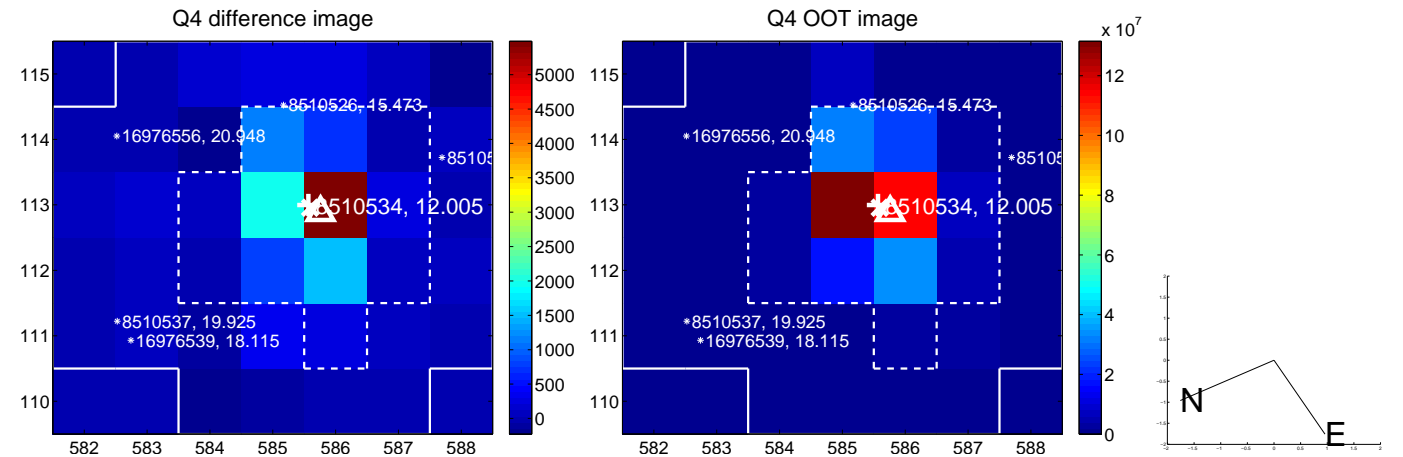
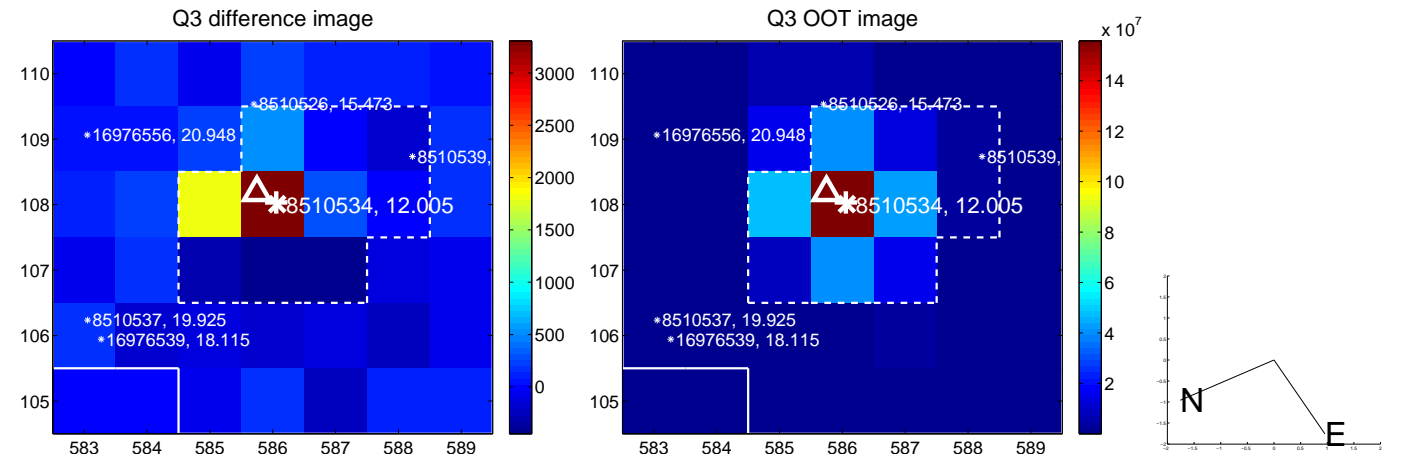
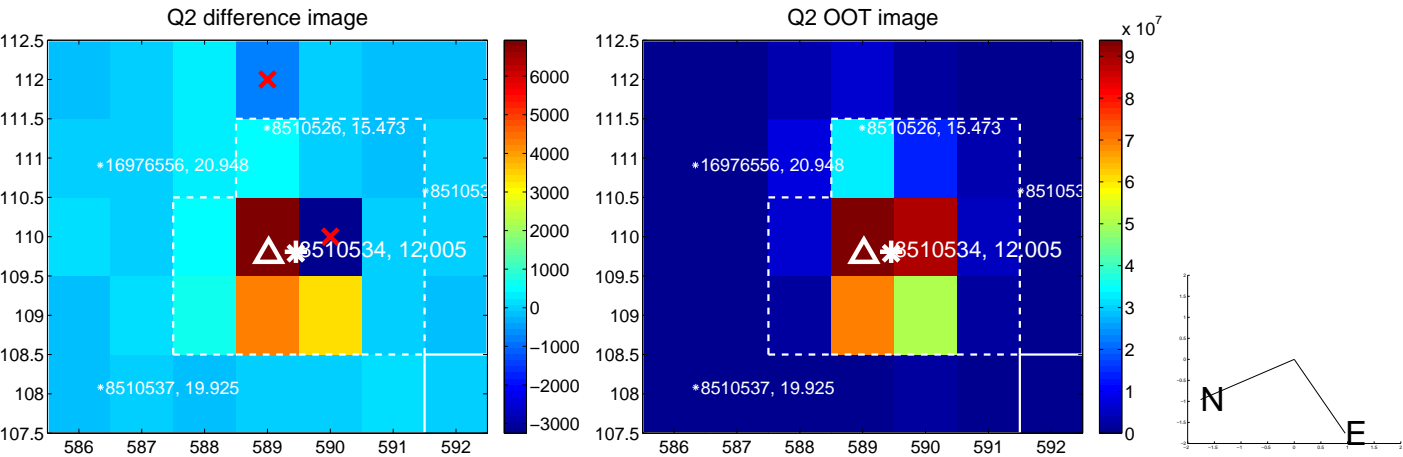
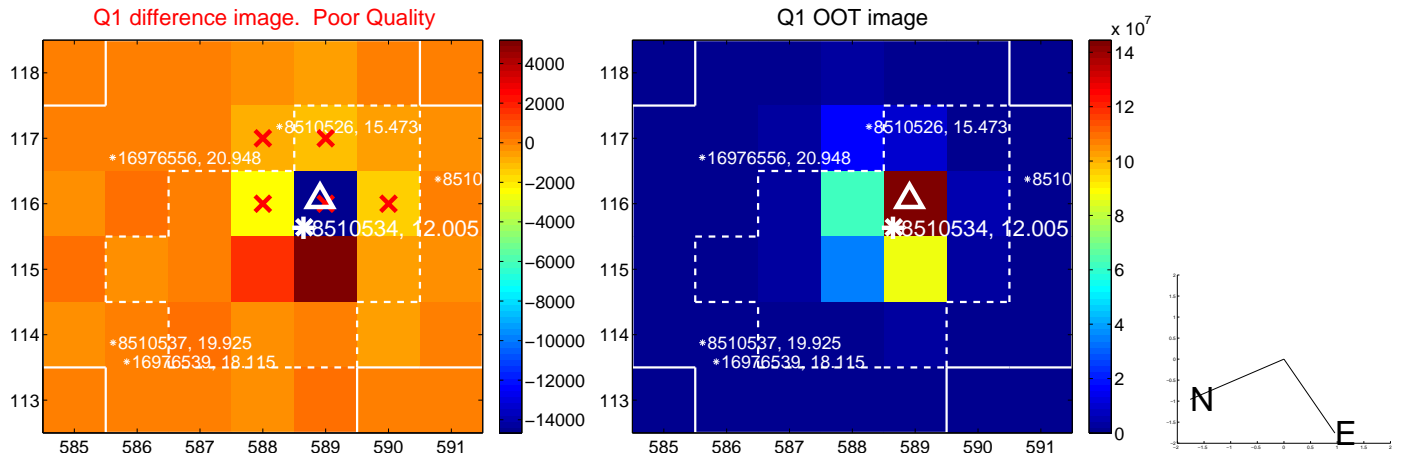
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.047 \pm 0.420$	0.11	$0.046 \pm 0.431$	$-0.006 \pm 0.387$
PRF-fit source offset from KIC position	$0.050 \pm 0.384$	0.13	$-0.049 \pm 0.402$	$0.011 \pm 0.374$
photometric centroid source offset	$0.32 \pm 0.21$	1.56	$-0.28 \pm 0.21$	$0.17 \pm 0.21$



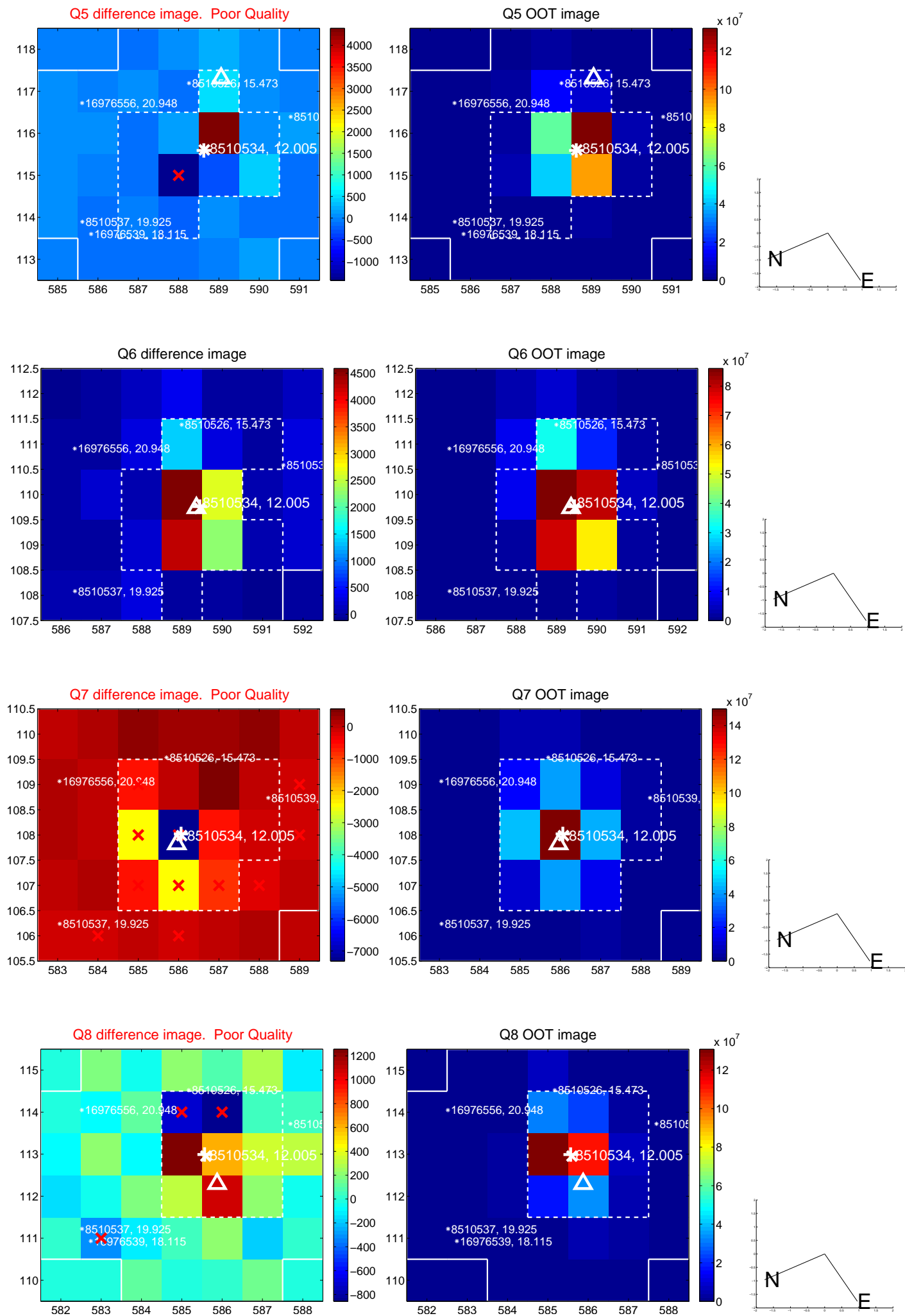
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.



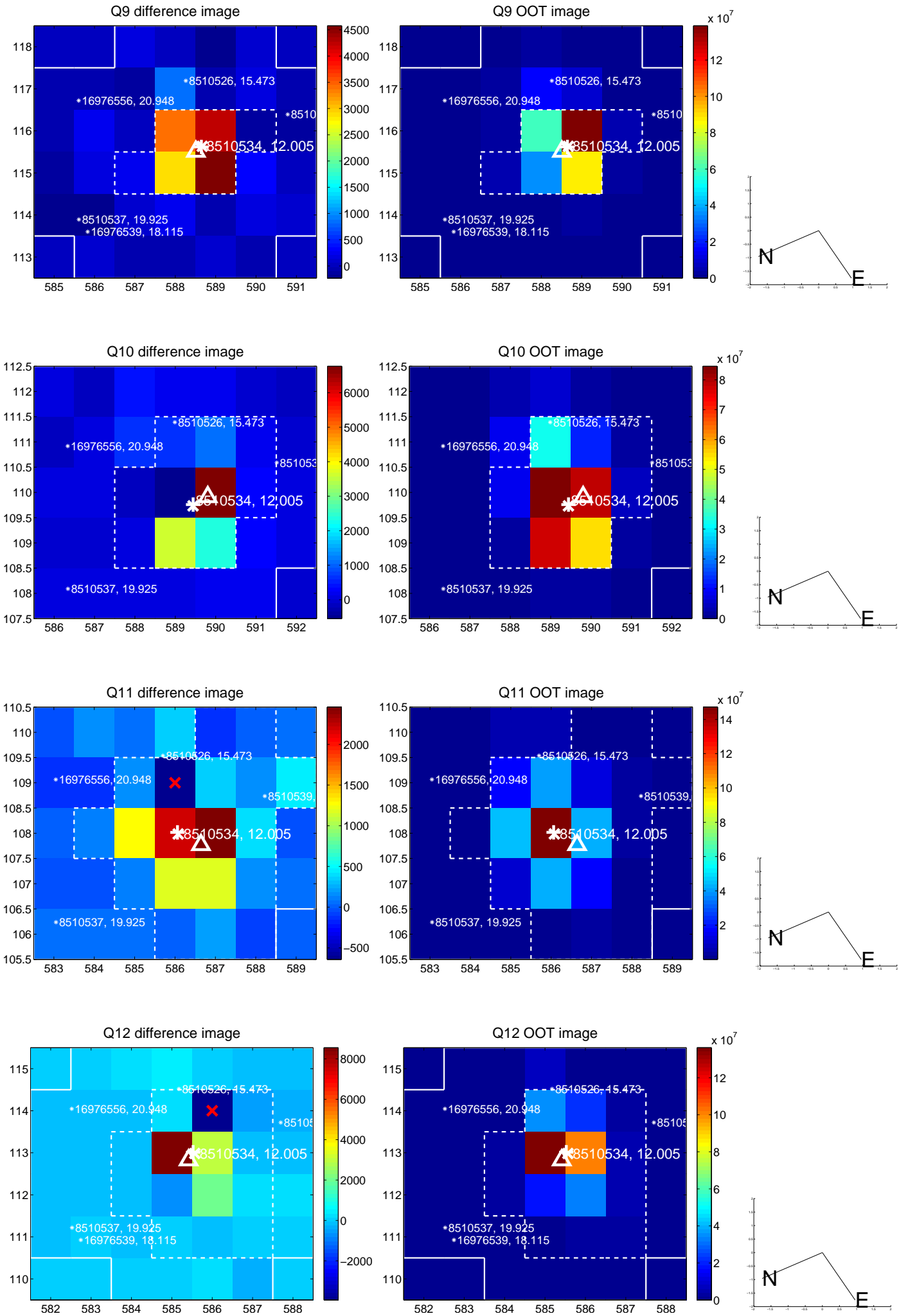
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



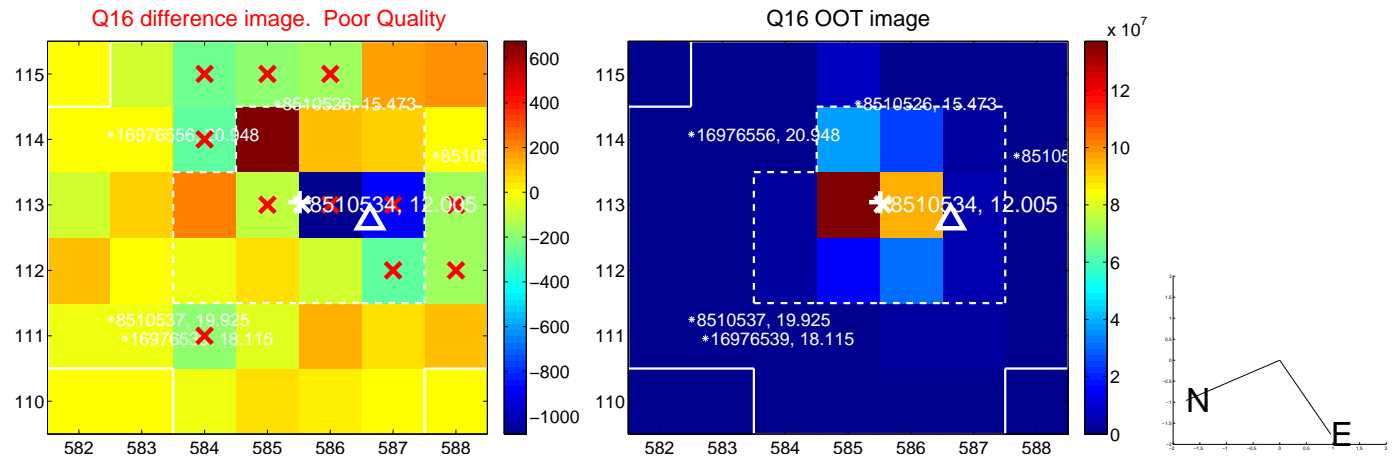
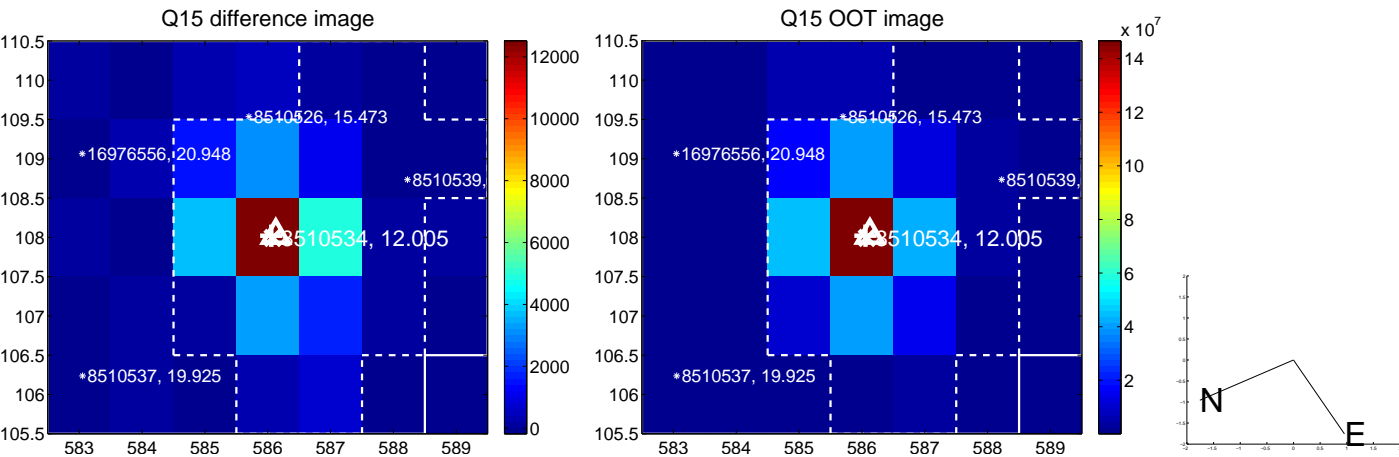
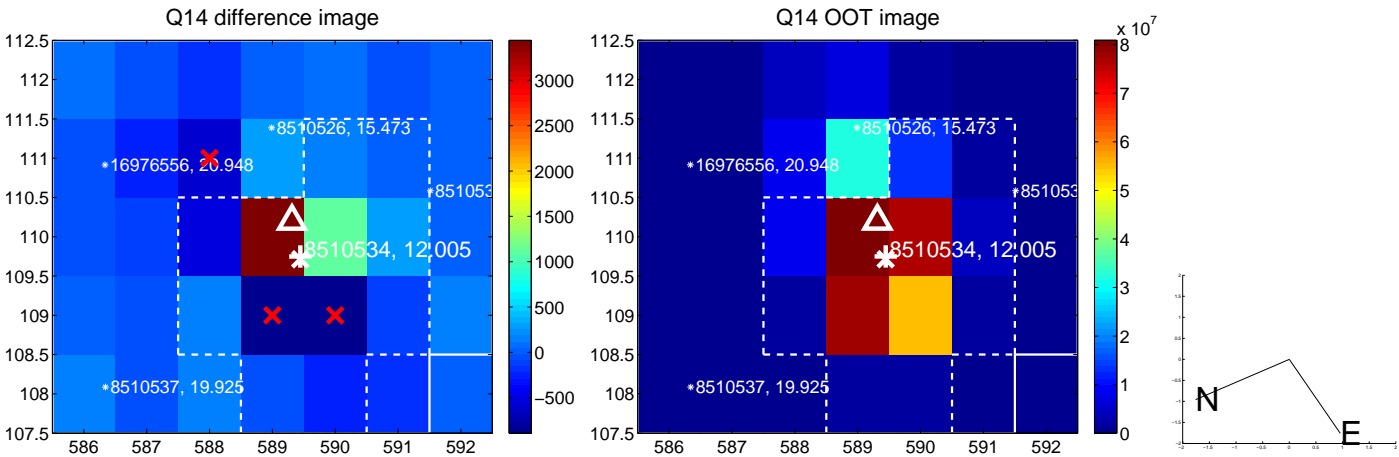
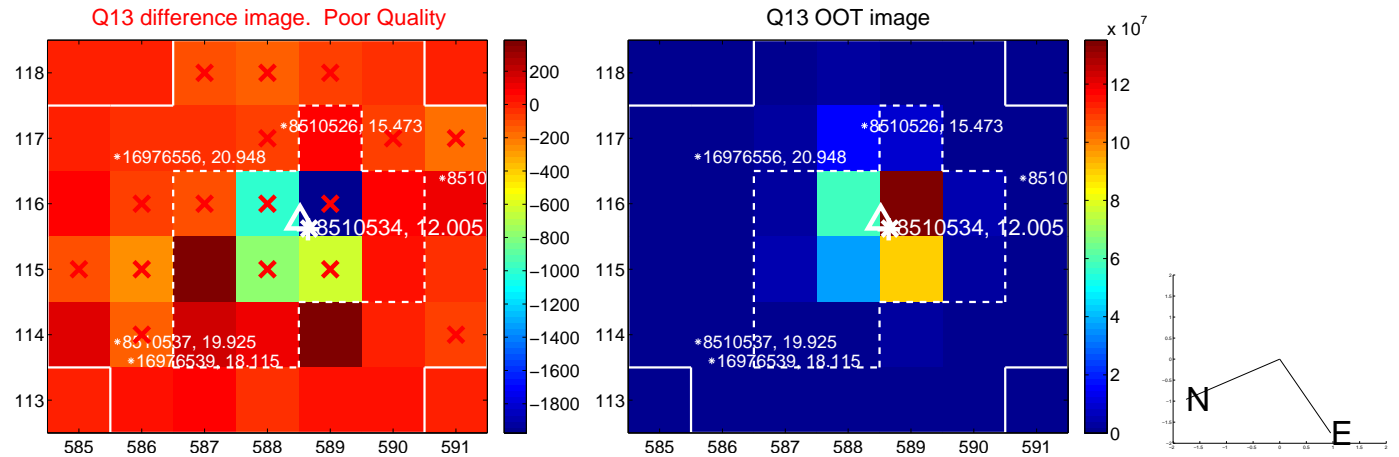
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



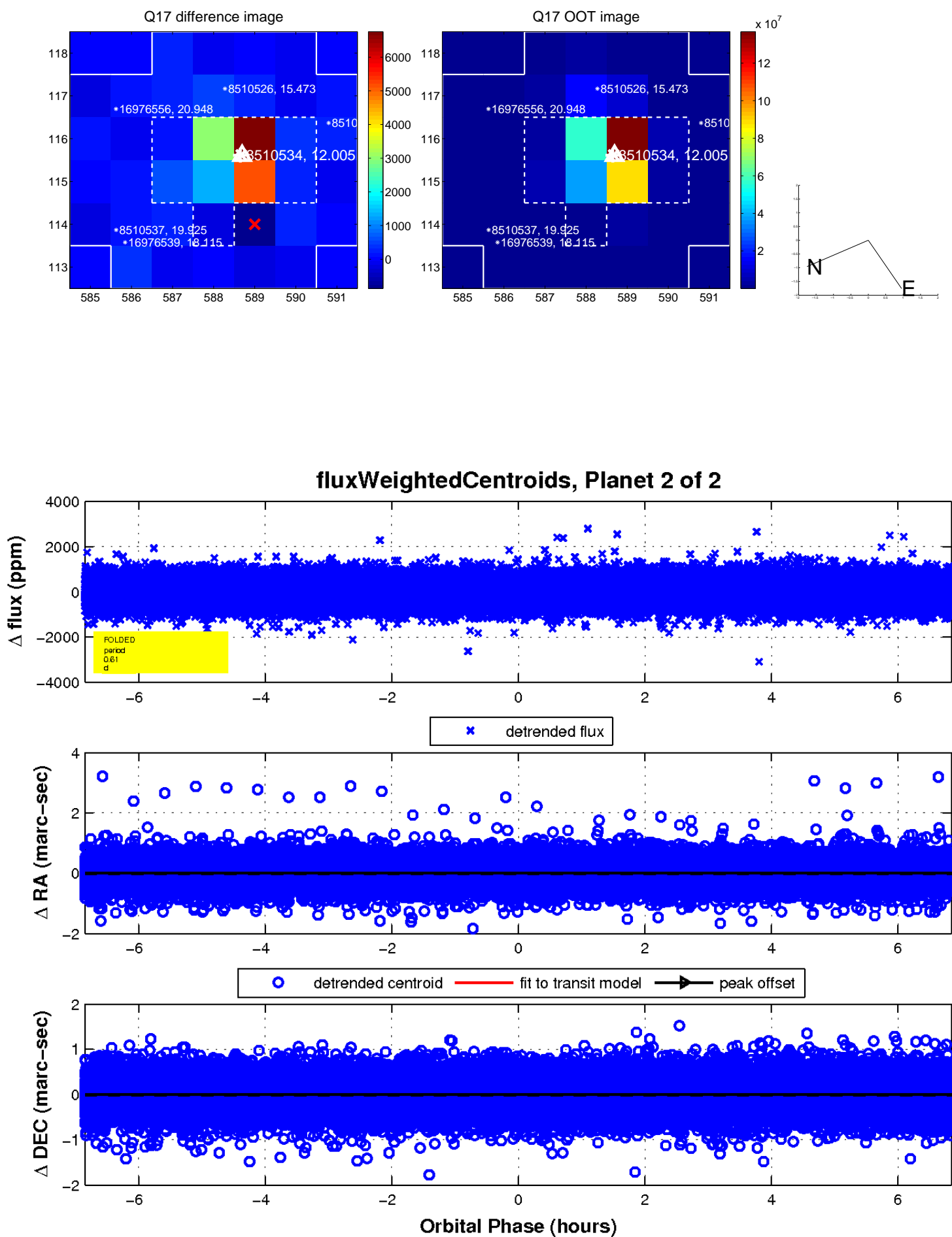
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination

